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SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1928

No. 501

POWERS-KENNEDY CONTRACTING CORPORATION and ANTHONY G. FLECK

Petitioners

against

CONCRETE MIXING AND CONVEYING COMPANY

Respondent

BRIEF FOR PETITIONERS

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INDEX.

	PAGE
Opinions of Lower Courts	1
Jurisdiction of this Court	2
Statement of the Case	3
Specification of Errors	9
The "Ulen Suit"	12
Argument	13
I. The Patent in Suit	14
II. State of Prior Art	17
Particular Patents	18
Smith, 122,497 and 122,498	18
Beach, 267,318	26
Farnham, 347,396	28
Warren, 671,303	28
Goldie, 707,840	29
McIlvrid, 958,421	30
Application of Prior Art to McMichael Patent	31
III. Respondent Does Not Use McMichael Device.	33
IV. Concrete Appliance Co. *v.* Gomery Decision..	34
V. Petitioners-Defendants' Device and Practice.	37
VI. "Slug" Theory of McMichael Patent	39
Testimony of Kirkland on same	44
VII. New Matter Inserted in McMichael Patent ..	47
All Litigation Based on "Slug" Theory	55
VIII. Prior Use in this Country	56
Leake's Prior Use	58
Jackson's Prior Use	65
IX. Errors of 2d Circuit Court of Appeals	69
The Particular Claims in Suit	81
Authorities	84
Patent No. 747,396, Farnham	(End of Brief)
Patent No. 671,303, Warren	(End of Brief)
Patent No. 707,840, Goldie	(End of Brief)

AUTHORITIES.

PAGE

Adams *v.* Gilliland, 242 U. S. 350 64
Atlantic Works *v.* Brady, 107 U. S. 192 84

Clark Pomace Co. *v.* Ferguson, 119 U. S. 335 87
Concrete Appliance Co. *v.* Gomery, 291 Fed. 486..... 24
Concrete Appliance Co. *v.* Gomery, 269 U. S. 177....24, 34, 69, 71

Concrete Mixing & Conveying Co. *v.* Storrie, 23 Fed. (2) 131 .....41, 51, 59, 63
Concrete Mixing & Conveying Co. *v.* Storrie, 27 Fed. (2) 838 .....51, 60, 62

Davis *v.* Schwartz, 155 U. S. 631 64
Dreyfus *v.* Searle, 124 U. S. 60 86

Genl. Electric Co. *v.* Sangamo Co., 174 Fed. 251 88
Grinnell Co. *v.* Johnson Co., 247 U. S. 426 87

Hollister *v.* Benedict, 113 U. S. 59 84

Lopulco Systems *v.* Bonnot Co., 24 Fed. (2) 510 88
Lovell Mfg. Co. *v.* Carey, 147 U. S. 623 84

Mich. Cent. R. R. Co. *v.* Consolidated Co., 67 Fed. 121 88
Morris *v.* McMillin, 112 U. S. 244 86
Motion Picture Co. *v.* Universal Co., 243 U. S. 502 83

Railway Co. *v.* Sayles, 97 U. S. 554 89

Singer *v.* Cramer, 192 U. S. 265 82

White *v.* Dunbar, 119 U. S. 47 83

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OCTOBER TERM, 1928.

POWERS-KENNEDY CONTRACTING CORPORATION and ANTHONY G. FLECK, *Petitioners,* *against* CONCRETE MIXING AND CONVEYING COMPANY, *Respondent.*	No. 501.

BRIEF FOR PETITIONERS.

May It Please the Court:

This case comes before your Honors on writ of certiorari issued to the Court of Appeals for the Second Circuit, based on conflicting decisions of that Court and of the Court of Appeals for the Ninth Circuit as to the validity of Patent No. 1,127,660 to McMichael, dated February 9, 1915.

Opinions of Lower Courts.

The opinion of the District Court for the Southern District of New York, holding the patent valid and infringed, has not been published, but is found in the Record, page 417. The opinion of the Circuit Court of Appeals for the Second Circuit, affirming the decree of the District Court is found in 27 Fed. (2) 668 (R. 444). The

opinion of the District Court for the Western District of Washington, holding the patent invalid, is found in 23 Fed. (2) 131, and the opinion of the Circuit Court of Appeals for the Ninth Circuit, affirming the District Court, is found in 27 Fed. (2) 838. Copies of all these decisions are printed in the appendix to our petition for the writ of certiorari (pp. 15-33).

Jurisdiction of This Court.

The jurisdiction of this Court was invoked by petition for writ of certiorari, based on the conflicting decisions as to the validity of the patent, rendered by the Courts of Appeals for the Second Circuit and the Ninth Circuit, hereinbefore referred to, and thereupon a writ of certiorari was granted by this Honorable Court on December 10, 1928. The date of the judgment to be reviewed is July 24, 1928, being the decree and order for mandate of the Circuit Court of Appeals for the Second Circuit (R. 348, said order affirming the decree of the District Court for the Southern District of New York, dated March 19, 1927 (R. 332 finding Claims 2, 4, 6, 17, 21, 22, 28, 34 and 35, of the McMichael patent valid and infringed.

The rulings of the Court of Appeals for the Second Circuit relied on as the basis of this Court's jurisdiction are the affirmance, by its said order of July 24, 1928 (R. 450), of the decree of the District Court for the Southern District of New York (R. 332 holding Claims 2, 4, 6, 17, 21, 22, 28, 34 and 35 of said McMichael patent valid and infringed by your petitioners.

The statutory provision relied upon is Judicial Code, Section 240.

A recent authority of this Court supporting our position on jurisdiction is *Concrete Appliances Co.* v. *Gomery*, 269

U. S. 177, wherein the writ of certiorari issued on conflicting decisions of the Circuit Courts of Appeals for the Third and Sixth Circuits, respectively.

Statement of the Case.

(We have endeavored to make this statement concise, but the material points are fairly numerous, as is often the case in patent suits.)

1. The McMichael patent was applied for January 14, 1907, and in the application *as filed*, he stated (Ulen Record, Exhibit D, p. 199):

> "The invention relates to apparatus for elevating and transporting *granular and plastic* building material, such as *sand, plaster, mortar and concrete.*" (Italics ours.)

2. The McMichael patent (R. 283 is for a very simple apparatus for pneumatically transporting (*i. e.*, "blowing" or "shooting" as it is called in the practical art) granular and plastic material. It consists essentially of a generally cylindrical chamber 1 (using the reference numerals of the patent) having a door 3 for introduction of the granular or plastic material, a delivery pipe 13, opening from the bottom of the chamber, into and through which the material is "blown" away to the desired place of deposition, and two pipes 8 and 10, both of which supply compressed air *within the chamber 1*, to "blow" the concrete into and through the delivery pipe.

3. *The McMichael patent, both as to mechanism and method of operation, is not a pioneer patent for pneumatically blowing concrete, or any other material, but is only a mere appropriation of the devices and methods of the prior patents.*

1. The method of pneumatically "blowing" concrete, and a mechanism for effecting it, *were old and well known long before the McMichael patent.* They were first disclosed in Smith Patent 122,498 *substantially as practiced by all, even the respondent, today.* That patent shows the cylindrical chamber, the delivery pipe through which the material is "blown," and *one* pipe for supplying compressed air.

5. The only *real* improvement which has since been made over Fig. 4 of Smith 122,498 is the introduction of the *second* compressed air pipe *into the bend of Smith's delivery pipe D. That improvement was not invented by McMichael but was made long prior to him.* It is not even disclosed in McMichael's patent, *but was disclosed long prior to him* in Beach, 267,318 (R 305 ; Farnham, 747,396; Warren, 671,303; Goldie, 707,840 in the rear of this brief.

5-a. The teaching is clear from these earlier and *expired* patents that granular, plastic and fluent materials, such as concrete, cement, grain, sand, can *all* be pneumatically blown by the *same* apparatus, that is, a chamber, having a bent delivery pipe, a compressed air pipe blowing into the chamber, to put pressure on top of the material in the chamber, and another blowing into the bend of the delivery pipe, to propel the material which is already in the pipe. But either of the compressed air pipes may be omitted, if desired.

5-b. The method of making *liquid or semi-liquid* concrete and the advantages of it in pneumatic blowing were disclosed in Smith, 122,497. *Petitioner is using approximately Smith's formula for its liquid concrete* (R. 297, 2d column, and R.206, fol. 270).

6. *Substantially identical apparatus* with that of McMichael, *operating in the identical manner*, for pneumatically transporting or "blowing" both granular and plastic materials are numerous and old in the prior art. That is, the prior art devices are substantially identical with plaintiff-respondent's device, but they are more efficient than the McMichael patented device. Examples of the prior art (later fully discussed in the "Argument") are:

U. S. Patent 122,498 to Smith, January 2, 1872 (R. 300) for blowing concrete;

U. S. Patent 267,318 to Beach, November 14, 1882 (R. 305) for blowing all kinds of material, including "mail matter" and grain (R. 396, lines 8-19; p. 397, lines 100-107);

U. S. Patent 599,055 to Davidson, February 15, 1898 (R. 312;

U. S. Patent 873,345 to Canniff, December 10, 1907 (R. 318, for blowing "grout" (a kind of concrete);

U. S. Patent 958,421 to McIlvrid, May 17, 1910 (R. 323, for the same purposes;

U. S. Patent 671,303 to Warren, April 2, 1901 (End of this Brief);

U. S. Patent 707,840 to Goldie, August 26, 1902 (End of this Brief);

U. S. Patent 747,396 to Farnham, December 22, 1903 (End of this Brief);

British Patent 12,758 of 1894 (Ulen Record, Exhibit D, pp. 381-387.

7. These prior patents show clearly that the pneumatic "blowing" of *all kinds* of materials, solid, granular, plastic, including concrete, grout, sand, grain, tea, "mail matter," and what-not, was widely and generally practiced, and these prior patents show only minor variations in the old and standard form of a sheet iron air-tight chamber,

a bent discharge or delivery pipe into which the material passes from the bottom part of the chamber, and one or two compressed air supplying pipes, *the location of which are varied as desired in the various patents.* The only feature of McMichael's structure not shown in the prior patents is the lower compressed air pipe 10, *discharging into the material within the chamber* (R. 283 and 284 lines 60-63). That appears to be a retrogression, rather than an advance in the art.

8. Petitioners *do not use this single novel feature* of the McMichael patent, but are using substantially the structure of prior patents to Smith, 122,497 and 122,498; Warren, 671,303; Farnham, 747,396, and Goldie, 707,840, *ibid.*, as petitioners' compressed air pipe discharges into the bend of the delivery pipe, as in most of the patents mentioned.

9. Respondent itself in its commercial apparatus (Ulen Record, Exhibit D, p. 194) has abandoned this trivial novel feature of its McMichael patent, and has practically copied the standard structures of the prior patents, namely, the chamber, the bent delivery pipe, one compressed air pipe discharging into the chamber, and another compressed air pipe *discharging into the bend of the delivery pipe* (Ulen Record, Exhibit D, pp. 184, 194). It is clear that respondent is not commercially under its own patent.

9-a. Respondent's main departure in its commercial apparatus from its own patent consists in introducing the lower compressed air directly *into the bend of the discharge pipe* and in the longitudinal direction thereof, thereby abandoning the one novel feature of the McMichael patent, and adopting *a structure and principle of operation old in many patents, e. g.,* Beach, 267,318;

Warren, 671,303; Farnham, 747,396; Goldie, 707,840, *ibid.*, British 12,758 of 1894, Fig. 8 (Ulen Record, Exhibit D, p. 387); *but is not disclosed in the McMichael patent in suit* (R.283-291

9-b. There is persuasive, if not conclusive, evidence, that the McMichael structure as disclosed in the patent in suit is inoperative (R. pp.52-55 This is supported by respondent's commercial non-utilization of that form, and its use of that in evidence (Ulen Record, Exhibit D, p. 194).

10. The "slug" method of conveying concrete *relied on throughout all the litigation below as the essential principle of the McMichael patent, is absolutely lacking from the McMichael patent as filed,* and was first inserted therein by amendment "D," filed January 24, 1911 (Ulen Record, Exhibit D, pp. 219-232) *four years after the filing of the application.*

10-a. *The McMichael patent is invalid in law by reason of the insertion of this new matter,* four years after filing, upon which new disclosure and the claims supported thereby, all the infringement suits have been based.

10-b. This illegal insertion of new matter in 1911, and as added to in 1913, includes R. page 285 lines 9-20, lines 25-130, R. page 286 *the entire page;* R. page 287 lines 1-76, being almost the entire patent (Ulen Record, Exhibit D, pp. 199-270).

11. Petitioners' apparatus (R.294) does *not* utilize *any* feature of a pneumatic blower which is novel in the McMichael patent.

11-a. Petitioners do not use any compressed air above the concrete in the chamber (R.201-207 *even if they*

did, they would be practicing the invention of Smith's patent 122,498 and not that of McMichael's.

11-b. Petitioners do *not* discharge *any* compressed air *into the concrete containing chamber*, but on the contrary, their *only* compressed air is discharged *into the bend* of the *discharge pipe* (R. 293), and in doing so, they are using the expired patents to Beach, 267,318 (R. 395); Warren, 671,303; Farnham, 747,396; Goldie, 707,840; *and this feature is not disclosed in the McMichael patent.*

11-c. It is true that in this feature of blowing compressed air into the bend of the delivery pipe, petitioners' and respondent's commercial apparatus are alike, *but they both are using this old feature* of the Beach, Warren, Farnham and Goldie *expired* patents, *which feature*, as stated, *is not disclosed in the McMichael patent.*

12. Petitioners use *only one* compressed air pipe, discharging into the bend of the discharge pipe, and operated in exact accordance with the prior patent to Goldie, 707,840.

13. Even if petitioners discharged compressed air into the upper part of the chamber *and* into the bend of the discharge pipe, they would be using the apparatus and method of the *expired* patents No. 671,303 to Warren (End of this Brief), No. 267,318 to Beach (R. 305 and No. 747,396 to Farnham (End of this Brief), and not the McMichael patent.

14. Respondent's apparatus operates precisely as does all the devices of the prior art, and all these devices operate precisely the same in blowing granular materials (such as sand or wheat) and plastic or semi-liquid materials (such as concrete or grout). This is shown not only by the prior patents, but respondent's chief engineer,

Kirkland, stated that he alternately blew "screenings" (*i. e.* finely divided rock) and sand, and concrete with respondent's apparatus (Exhibit H, Jour. West. Socy. Engineers, pp. 334-5).

15. Prior use of the device of McMichael's patent was established by witnesses Artingstall (R.34-59 Fanning (R.112-125and Kirkland (R106-7 in connection with Exhibit H, being the "Journal of the Western Society of Engineers," dated May, 1918.

Specification of Assigned Errors.

The Court of Appeals for the Second Circuit erred on the following points:

1. Said Court erred entirely in holding the McMichael patent in suit to be valid:

1-a. Against the showing of the prior art, considered alone.

1-b. Against the showing of the prior art as it should have been applied in the light of the decision of your Honors in *Concrete Appliance Co.* v. *Gomery*, 269 U. S. 177.

1-c. Against the clear record showing of the invalidity of the McMichael patent by reason of the introduction of new matter into the application in 1911 and 1913.

2. In construing the *Concrete Appliance Co.* v. *Gomery* decision absolutely oppositely to its clear and plain import, and thereupon refusing to consider its bearing on the question of invalidity of the McMichael patent.

3. In holding that the *Concrete Appliance Co.* v. *Gomery* decision did not require the Court to reconsider

the validity of the McMichael patent over their decision in the *Ulen* suit (*Concrete Mixing & Conveying Co.* v. *Ulen Contracting Co.*, 12 Fed. [2] 929, 931) wherein (a) different prior art was relied on, (b) the defendant used a different apparatus, and (c) did not use "wet" or liquid concrete, to which material the *Concrete Appliance Co.* v. *Gomery* decision pertains, and which material petitioners used exclusively.

4. In refusing to correctly consider the prior art, which conclusively showed:

4-a. The pneumatic blowing of practically all kinds of fluent and mobile materials to be very old.

4-b. The pneumatic blowing of *concrete* to be old, and disclosing the use of *"liquid"* or *"wet"* concrete for that purpose.

4-c. Various kinds of materials can be pneumatically blown with practically any given device or apparatus.

4-d. The mechanism or apparatus for pneumatically blowing all kinds of materials had become well known (and fairly standardized) in all its main features, viz.:

1. The air tight chamber;
2. The delivery pipe (with a bend therein);
3. The compressed air supplying means of various forms, including

3-a. compressed air supplied into the top of the chamber only;

3-b. compressed air supplied into the delivery pipe only; or

3-c. a combination of 3-a and 3-b.

This left nothing for McMichael to invent, and he merely appropriated from the prior art.

5. In holding the McMichael patent a pioneer patent for blowing concrete, in the face of the prior art, and especially Smith patent, 122,498.

6. In not holding that McMichael was not the first inventor of any substantial or material part of a device or method for pneumatically blowing concrete or other fluent or mobile materials.

7. In not holding the McMichael patent to be invalid by reason of the introduction into the application (filed January 14, 1907), of new matter, mainly in the "amendments" of January 14, 1911, and March 29, 1913, constituting a great preponderance of the entire specification, and by said "amendments" of 1911 and 1913 *introducing into the specification for the first time the "slug" theory, on which all the litigation brought on the patent has been based.*

8. In not holding the McMichael apparatus to be inoperative in view of the evidence adduced on this point.

9. In not holding the McMichael patent to be invalid on the testimony of Kirkland, respondent's chief engineer, taken in connection with his statements made in the article in the "Journal of the Western Society of Engineers," on May 13, 1918, establishing that the device of McMichael's patent operated exactly as do those of the prior art (Exhibit H).

10. In not holding that the testimony of witnesses Artingstall (R. 34-59 and Fanning (R. 112-125 established invalidating prior use, especially in view of the statements made by Kirkland, respondent's chief engineer, in said Journal of the Western Society of Engineers in May, 1918.

11. In not holding the McMichael patent to be invalid

on each and every one of the grounds hereinbefore set forth.

12. In not holding that petitioners do not infringe the McMichael patent.

The Ulen Suit.

In the decision of the Circuit Court of Appeals herein "the Ulen suit" is referred to, and brief explanation concerning that suit appears to be necessary here. That was a suit brought by the plaintiff-respondent here, Pneumatic Concrete Mixing & Conveying Co. against Ulen Contracting Corporation and Shandaken Tunnel Corporation in the Southern District of New York. The defendants' device in the Ulen suit was entirely different from that of your petitioner, and there were materially different defenses in the two suits. In the Ulen suit, defendant's machine used "*dry*" concrete and did not use liquid or "wet" concrete, as did petitioner in the present suit; your petitioner having always used fluent or liquid concrete, in accordance with Smith Patent 122,497, and mechanism taken from Smith Patent 122,498 and other expired patents. Neither of these Smith patents was in evidence in the Ulen suit, nor was Beach Patent No. 267,318, as well as others. The facts that (1) the mechanism in the Ulen suit was different, that (2) they blew *dry* concrete and not *liquid* concrete, and that (3) the principal prior patents relied on here were not in evidence there, render that suit practically irrelevant and moot so far as the present suit is concerned. Your petitioners were not parties to nor in any wise connected with the Ulen suit.

The decision of the District Court in the Ulen suit is reported in 12 Fed. (2) 1929, and the *per curiam* affirmation thereof by the Court of Appeals for the Second Circuit is found in 12 Fed. (2) 931.

ARGUMENT.

Brief Preliminary Summary of Argument.

1. The patent in suit discloses nothing more than the old standard device for "blowing" granular and plastic materials.

2. The use of this device for "blowing" concrete was disclosed in expired Smith patent 122,498, and the use of liquid or "wet" concrete in Smith patent 122,497.

3. The use of an air tight chamber, a delivery pipe, and one or two compressed air pipes were old for "blowing" all kinds of materials.

4. McMichael is a mere appropriator from the prior art.

5. Respondent's commercial device embodies prior patents rather than the McMichael device.

6. Petitioner used only devices of expired prior patents.

7. "Slug" theory of McMichael patent, on which all the litigation was based, is non-existent.

8. In any event, it was first inserted in McMichael's specification four years after filing, and renders the patent invalid.

9. Invalidating prior use was established in this case.

10. Findings of fact in C. C. A. 9th Circuit of invalidating prior use "must be treated as unassailable." *Adams* v. *Gilliland*, 242 U. S. 350.

I. The Patent in Suit.

This McMichael patent pertains to the old and highly developed art of conveying granular and plastic materials by pneumatic propulsion. By amendment in the Patent Office, four years after filing, the application was limited to the pneumatic transportation of concrete (commonly called "blowing" concrete). As a matter of perspective, it should be borne in mind that means for "blowing" many diverse kinds of materials are shown in the prior patents, *and the "blowing" of concrete was previously well known* (Smith Patents 122,497 and 122,498 [R.297-304. That is, the Smith Patent 122,498 shows an air tight chamber or tank F, with a bent delivery pipe D, opening from the bottom thereof, and a compressed air supplying pipe *f* for putting pressure on the chamber to drive the liquid concrete through pipe D to a place of delivery. This apparatus is of the general type used for blowing *all* kinds of materials, and it is, therefore, a clear disclosure that concrete may be "blown" in exactly the same manner and with the same mechanism as grain, sand, ashes, and other materials.

The mechanism or apparatus of the McMichael patent comprises a cylindrical chamber 1, having a conical bottom portion, and a lid 5 through which the material is introduced into the chamber 1. There is a discharge or delivery pipe 13, extending a short distance downwardly vertically from the bottom of chamber 1, the pipe having a bend and extending thence horizontally, and through this pipe the concrete or other mobile material is "blown" or conveyed away. The compressed air is introduced through a pipe 8 into the upper part of the chamber 1 and supplies air pressure upon the surface of the concrete or other material within the chamber, and a second

compressed air pipe 10 also discharges compressed air *into the material within the lower part of the chamber.* On this point, the specification as filed (R.284 lines 60-63) states:

> "10 is an air pipe controlled by a valve 11, and also leading air into the chamber, the delivery end of said pipe being at or near to the discharge or lower end of the hopper 2."

The *function* of this *second* stream of compressed air from pipe 10 is described in the *original* specification (R. 285 lines 21-24) as follows:

> "To loosen the material at the lower end of the hopper, and to assist its movement, I provide the additional air pipe adapted to discharge air in and through the material."

(The term "hopper" refers to the lower conical part of the chamber 1.)

That is all the disclosure concerning this second compressed air pipe there was in the McMichael application *as filed.* A very different function and principle of operation were described therefor *in the new matter illegally introduced into this application on January 24, 1911, and March 29, 1913,* as will be later hereinafter described.

The operation of "blowing" or transporting concrete, or other material, through the delivery pipe 13 is briefly described in McMichael's *original* specification as follows (R.284 lines 82-98):

> "The instant the air is turned into the chamber the door for the closure will be finally held in closed position by the air pressure. Owing to the pressure in the receiver, the material in the hopper will be forced downward and directed into the conveying tube, being carried along by the latter until

> it is finally discharged at 15. Owing to the provision of the U-shaped bend in the conveying tube immediately after leaving the hopper, the material will be more or less tightly packed as it is directed therethrough."

That is, the operation of this mechanism, as originally described, is just like that of any other blower.

In brief, the concrete is placed in chamber 1, compressed air from pipe 8 puts pressure on the top surface of the concrete and pushes some of it into and along delivery pipe 13, the air from pipe 10 serving (R.285 lines 21, 24) "to loosen the material at the lower end of the hopper (*i. e.*, within the chamber 1) and to assist in its movement." That is, all the elaborate process of cutting off "slugs" or cylinders of concrete, and of mixing the concrete in the delivery pipe were first introduced into the application in 1911.

II. (a) An air-tight chamber, with (b) a bent delivery pipe and (c-1) one, or (c-2) two, compressed air pipes, was in general use for "blowing" all kinds of materials long prior to McMichael.

II-a. McMichael not a pioneer inventor, but merely an appropriator of prior inventions.

We will show hereinafter from the prior art that long prior to McMichael the "blowing" of all kinds of granular, plastic and other fluent and mobile materials was well known, as was also the fact that a particular device would "blow" or convey successfully many different kinds of materials; and also that the mechanism for "blowing" all kinds of materials had become practically

standardized. McMichael was merely an appropriator, a mere follower of earlier inventors in these three respects, namely:

(a) the form and structure of his apparatus,

(b) the principle and method of its operation, and

(c) the material or materials operated upon.

In fact, we will show that McMichael's only change from prior patents is in having the second compressed air pipe 10 discharge the compressed air *into the material within the chamber 1* instead of discharging directly into the bend of the delivery pipe. This latter form had become standard in the art prior to McMichael (see Beach, Farnham, Warren and Goldie patents) and *is employed by respondent in its commercial machines.* This one feature of difference in the McMichael patent (*i. e.*, discharging a second stream of compressed air *into the material within the bottom part of the chamber*), neither petitioner nor respondent used in their commercial devices.

II-b. State of the Prior Art.

The following fundamentals of the art were long known and successfully practiced prior to the filing of McMichael's application for patent:

1. The application of pneumatic "blowing" to all kinds of liquid, particulate, or other fluent materials was well known, such as sand, concrete, grain, grout (which is practically one form of concrete), ashes, mail-matter, as well as others (see Smith, Beach, Farnham, Warren and Goldie patents, discussed later herein).

2. A certain type of apparatus had become practically

standard long prior to the filing of McMichael's application. That apparatus comprised

(1) a chamber to receive the material to be blown,

(2) a delivery pipe through which it is pneumatically conveyed away, and either

(3-a) one or (3-b) two compressed air pipes, *as might be selected or preferred by the particular inventor or designer,* for supplying the air to convey the materials into and through the delivery pipe to the place of delivery (see said prior patents, discussed later herein).

In all the prior patents wherein one compressed air pipe is used, the air is introduced either (1) into the chamber above the material to be blown, *or* (2) into the bend of the delivery pipe. In some patents two pipes, arranged as described, are used. McMichael is the only one to introduce a second stream of compressed air *into the material within the bottom part of the chamber,* and *that is his sole departure from mere appropriation of the prior art structure and practice.*

II-b-1. Consideration of Particular Prior Patents.

Patent No. 122,497 and No. 122,498 to Smith, dated January 2, 1872.

Patent 122,498 is a most notable contribution to this art, as *it discloses the main essentials of the machine for, and method of, pneumatically blowing concrete as practiced today.* It shows also a power machine for mixing concrete, but that is not involved here. In fact, it also shows the structure and method of making concrete roadways and other structures practically in accordance with the standard engineering practice of today, and there has

been little to add to the art since. The disclosure is notably complete and practical.

Patent 122,498 states (R.302-304as follows:

> "A distinctive feature in my method of laying pavements consists in manufacturing the *concrete composition in a fluid or semi-fluid state, so that it will flow through pipes*, and in conveying it from the mixing machine *to the spot where it is to be laid, in pipes or conduits* and flowing it from the pipes upon the ground, or upon a suitable foundation, where it immediately sets and forms the pavement, its surface being molded to any desired conformation by means of surface molds.
>
> "In thus constructing pavement I preferably use the composition described in an application for Letters Patent of the United States filed by me contemporaneously herewith; but in my improved process or method of laying pavements as herein described, I do not confine myself to that particular composition, but propose to use any composition whatever, now known or hereafter to be discovered, the *properties of which adapt it to be conveyed and laid while in a fluid state.*
>
> . . . . . .
>
> "The machine is provided with a rotary mixing-vessel, C, with a crane or other suitable hoisting apparatus, B, which dumps the materials into the mixing-vessel, with a series of grinding and mixing disks, and wheels M N working within the mixing-vessel, with adjustable and movable pipes or conduits D, through which the *liquid concrete composition* is conveyed from the machine to the street; and *also, if preferred, with forcing apparatus F, which forces the fluid into and through the pipes to its destination.*
>
> . . . . . .
>
> "The liquid composition, after it has been thoroughly mixed with the *pebbles, gravel, or*

broken stone, flows off from the mixer through passages *d*, provided with suitable valves, into the pipe D, which delivers it wherever it is required for use. *When it is necessary to force the* LIQUID UP HILL, *or to convey it quickly or in larger quantities than usual,* or THROUGH LONG PIPES, or *to press it in the mold* and expel the air therein, in which it might begin to stiffen before reaching its destination, I employ a forcing apparatus to propel it through the pipes, the same consisting, preferably, of a tight *chamber, F, capable of resisting great pressure,* into which the liquid flows from the mixer, and a pipe, *f*, by which *steam* or COMPRESSED AIR can be introduced into the chamber F, upon the LIQUID, to force the *latter, by pressure, into the pipe D. Any other species of forcing apparatus may, however, be substituted, if preferred.*

* * * * * * *

"By reference to my application for Letters Patent upon the composition which I prefer to employ with this machine, it will be observed that the constituent elements of such composition are *cement, sand, water, and gravel,* or *broken stones.* In preparing such composition I place the cement and sand in the mixer, in suitable proportions, and add the water and the *broken stones,* the apparatus being either in motion or not, as preferred. If not in motion I start it up and run it till the cement and water have become *liquid,* and the sand and broken stones thoroughly and uniformly mixed therewith. I then open the valves and let it flow off through the pipe D. New materials may be continuously fed to the machine while it is in operation, or the mixing-vessel may be successively filled and emptied, as the manufacturer may prefer."

In his companion *Patent No. 122,497,* Smith describes and claims *the modern liquid or fluent concrete now in*

universal use, substantially as it is used in general practice today. In this patent he discloses completely the modern liquid or "wet" concrete. The patent states:

> "In an application filed by me contemporaneously herewith [that for patent 122,498] for Letters Patent of the United States I have described certain improved machinery and appliances for manufacturing and mixing *concretes for pavements, buildings,* and other purposes, conveying it from the machine to the place where it is to be laid or used, and suitably *laying or casting it in molds or* otherwise to the required form. By reference to the specification filed therewith it will appear that such apparatus is specially adapted to the manufacture and use of *a liquid or semi-liquid concrete composition which can be conveyed through pipes and cast in molds.* No concrete composition has ever been brought into public use for the purposes referred to which is capable of being thus manipulated; nor has it been deemed practicable to attempt to *invent a composition sufficiently liquid to flow freely through pipes and yet able to set quickly upon reaching its destination, so as to form in a very short time a solid mass of artificial stone.* Such a composition, however, I have discovered, and *have proved, by a thorough course of experiments and trials, its complete fitness for the purposes and the great practical utility of its application in the manner referred to.* So far, therefore, as relates to this division of the subject-matter contained in my several applications for Letters Patent, my invention consists in a composition prepared substantially as hereinafter described, so as to be capable of use in a fluid or semi-fluid condition, for the purposes specified.
>
> "I take any good hydraulic cement, preferably Portland cement, and sand, gravel, or some equivalent of sand or gravel, such as broken shells, slag,

etc., and mix them together in about equal proportions by specific weight. This mixing may be accomplished by any suitable means, but preferably by the machine described in my other application above referred to. To the mixture *of cement and sand*, in the proportion of two parts, by weight, I add *three parts, by weight, of broken stone, using therefor any of the varieties of stone suitable for the purpose*, such as *blue-stone, quartz, the ordinary cobble-stones employed for paving purposes, granite, &c.* I then add a quantity of water equal to about three-fifths of the entire mass of materials already commingled, and agitate the mixture thoroughly by mechanical means until the whole is of a *fluid character, capable of flowing freely through pipes and of being run into covered molds.* It is then ready for use.

"It will be seen from what I have stated that the materials employed by me in making this improved composition are old, every one of them having been used for many years. My invention does not consist in being the first to combine such materials, but in being the first to combine them for the arts in such proportions that *a liquid or semi-liquid mass results which can be flowed through pipes* and run into covered molds, and which can be made and used *in laying pavements, building houses and other structures*, etc., *by means of the improved machinery described in my said accompanying application.*

"I do *not claim to cover a pasty mass* which can be pressed into blocks but *which will not flow through pipes*, the great practical advantage of my improvement being the adaptation of the material to a new method of conveying and laying it for the purposes set forth.

"The proportions above stated may be varied within certain limits without departing from the spirit of my invention. However they may be varied, *so long as the result is a composition which*

> *will flow through pipes or run into molds,* it comes within the scope of my claims. Indeed, with certain species of stone of different specific gravities, the proportions of sand, water, and cement must necessarily be slightly varied. The heavier the stone the more dense must be the surrounding liquid in order to sustain it. *The broken stone must be held uniformly diffused throughout the mass, and the liquid, while thin enough to flow even with the stones intermingled, must be thick enough or have tenacity enough to keep the stones from settling to the bottom."*

The claim of the patent reads:

> "The paving or building composition herein described, when prepared for use in a liquid or semi-liquid condition, capable of flowing in pipes and running into molds, substantially as described."

We have quoted extensively from these two Smith patents because of their almost complete disclosure of the modern art of blowing "wet" or liquid concrete. *The Court of Appeals for the Second Circuit held that these patents have no bearing on the present case.* We submit that, in themselves, they are a substantially total anticipation of the McMichael patent except as to trivial details.

These Smith patents were not found by the Patent Office during the prosecution of the application for McMichael's patent.

Thus it will be seen that at this early date, Smith had made a complete disclosure of how to make liquid concrete, and of the apparatus and method for "blowing" it through pipes and depositing it into the molds or forms. Patent 122,497 teaches clearly that concrete may be made of a consistency at once fluent so as to be pneumatically blown through pipes and *yet sufficiently strong so as to*

maintain even large stones as a constituent of the concrete, just as is done in modern commercial practice. The reason why the "liquid" or "wet" concrete so fully disclosed and claimed in Smith 122,497 was in disuse for many years and then passed into almost universal use is fully explained in *Concrete Appliance Co.* v. *Gomery,* 291 Fed. 486, 489, as follows:

> "Moreover, a study of the proofs satisfies us that from the time concrete came into use there had been a struggle between the architects and designers, who, as a class, favored the use of dry concrete, which would not flow, and the contractors, who, for construction convenience, favored wet or mush concrete, which would flow, and therefore allow the use of distribution chutes, and that, as soon as the use of wet concrete became general, the art used the wet concrete chutes, which it could not use for the dry. In that regard, the proof was that:
>
> " 'The more reinforced concrete came into use, the more contractors used wet concrete, and I should say that from 1908 on very much the greater portion of construction work was done in concrete than before; hence, also, the more wet concrete was used since that time.'
>
> "In these evolutionary stages of the concrete art, the proof is that the builders of grain elevators took a leading part in the use and distribution of wet or mush concrete."

On this point also, in this same case on appeal, *Concrete Appliance Co.* v. *Gomery,* 269 U. S. 177, 182, your Honors held:

> "Before 1904-5 it was common practice for architects' specifications to require that concrete used in building operations be mixed *'dry'*; that is, of a consistency which would not admit of its ready

> flow by gravity. This practice was resisted by engineers and contractors, because it was cheaper and easier to use 'wet' concrete, which could be conveniently distributed through chutes and conduits. For reasons which need not now be inquired into in detail, the increasing use in earlier years of 'wet' concrete in all types of structural work *had become the established practice by 1905.* Contemporaneously with this increasing use, and, as the proofs show, an active agency in inducing it, was the practical adaptation of the apparatus, used in moving and distributing grain and other substances of similar mobility, to all the requirements for the convenient handling and distribution of concrete by gravity in building operations."

The only substantial improvement which has since been made in the apparatus shown in Fig. 4 of Smith, 122,498, has been the introduction of a second pipe which discharges compressed air *directly into the bend of the delivery pipe D, and blowing in the direction of discharge of the material* through the pipe. This feature is shown in the prior patents to Beach, 267,318, Farnham, 347,396, Warren, 671,303 and Goldie, 707,840, discussed later herein. The only other change, or minor improvement which has been made over Fig. 4 of Smith, 122,498, is sloping and contracting the bottom of the chamber, *and that is shown in the Beach and Warren patents.* McMichael simply appropriated the sloping bottom from them. In respondent's *commercial* machine, it has also appropriated the old feature of having the second compressed air pipe discharge directly into the bend of the delivery pipe (Ulen Record, Exhibit D, pp. 184, 194). As to the narrowed or "hopper bottom" Judge BOURQUIN held, 23 Fed. (2) 131, 133:

> "* * * containers with hopper bottoms to direct the flow of their contents preceded McMichael for time so long, the memory of man runneth not to the contrary."

Selecting two old features from two prior patents, is no more an invention than selecting one feature from one patent. Selection and appropriation are not invention, even if repeated.

Attention is exemplarily directed to four prior patents, as follows:

Patent No. 267,318 to Beach, dated November 14, 1882 (R. 305).

Beach states the general objects of his invention (R. 396, lines 8-19) as follows:

> "My invention relates to pneumatic transportation; and the objects of my improvement are to provide a continuous current of air passing through a tube, pipe, or box at great velocity, into which current of moving air the article or matter to be transported or conveyed is, in limited quantities, continuously projected or impelled, and also to transmit such article or matter through the tube while in a state of suspension in the air in the tube, and without contact with the sides or bottom of the tube."

It will be noted that Beach has the chamber E to hold any one of a variety of fluent or mobile materials, and the chamber has an inwardly and downwardly-curved bottom. Compressed air is supplied from the chamber A, which may have (R.306 lines 33-35)

> "* * * air condensed to any degree of elasticity required and kept at a constant equal pressure."

The compressed air is directed through pipe B on to the top of the material in the air-tight chamber E. Air is also blown from the air supply tank A through the pipe G, *into the bend of the delivery pipe H*, and in the direction of the flow of the material (R.306 lines 36-38) which stated as follows:

> "G is a pipe, tube or box, an open end of which is inserted in the reservoir A so as to receive the air from the reservoir."

The material is blown into the receiver K which "will be placed at a point of considerable elevation above the surface of the earth" (R.307, lines 73-74). In Claim 1 of this patent the mechanism is described as transporting "mail-matter, flour, grain or other articles to be transported."

The Beach patent discloses, in addition to the structure of Smith, 122,498, the blowing of the second stream of compressed air into the bend of the delivery pipe in the direction of conveyance of that pipe and discloses the application of pneumatic "blowing" to a wide variety of materials. To add to the device of Fig. 4 of Smith, 122,498, a second compressed pipe, discharging into the bend of his delivery pipe D, would be a mere matter of entirely obvious mechanical change, in the light of the Beach patent. This is likewise true with respect to the Farnham, Warren and Goldie patents now to be described. This Beach patent also shows the inward and downward contraction of the bottom of the chamber toward the entrance to the delivery pipe previously referred to herein. If any point should be made by opposing counsel of the presence of valves in the delivery pipes of Beach, it may be noted that a gate valve such as is

shown but not numbered in Smith, 122,498, leaves the pipe entirely unobstructed when open, and is common practice.

Patent No. 747,396 to Farnham, dated December 22, 1903 (End of this Brief).

This patent shows a receiving chamber 1, the delivery pipe 2, 6, a compressed air pipe 7 for introducing the compressed air within the chamber *on top* of the material, and another compressed air pipe 7 directing a second stream of compressed air *into the bend of the delivery pipe.* This patent is described as being applied to the conveyance of sand, but the teaching as to the conveyance of all kinds of liquid and fluent materials, including liquid or fluent concrete, had already been fully taught in the prior patents to Smith and Beach. *The Farnham patent is another example in the prior art teaching the advantage of introducing the second stream of compressed air into the bend of the delivery pipe and in the direction of travel of the blown materials.* Farnham states (p. 1, lines 83-89), that the top air stream may be cut off and both streams may be varied.

Patent No. 671,303 to Warren, dated April 2, 1901 (End of this Brief).

This patent is for a device for blowing sand, and has the chamber A with the bottom part of conically downwardly inclined shape. The compressed air is directed onto the top of the material in the chamber A through a pipe J, and is directed into the bend of the delivery pipe M. It is true that the delivery pipe in Warren would be changed in shape and dimensions for blowing concrete, substantially into that shown in Smith, 122,498, but one of the main bearings of the Warren patent is

in teaching the advantage of introducing a second stream of compressed air into the bend of the delivery pipe and in the direction of flow of the blown materials. The addition of a second stream of compressed air into the bend of the pipe D in the device of Smith's patent, 122,498, in view of the teachings of the Beach, Farnham and Warren patents, would be a simple matter of selection from the known prior art. This Warren patent also discloses the conical or hopper like bottom portion of the chamber. There is no point to the objection, made in the opinion of the Court of Appeals of the Second Circuit, that the delivery pipes of some of these patented devices are of relatively small diameter. That is merely an obvious feature of design, and is not invention. On that point, the McMichael patent states (R. 375, lines 113-122) that "the engineer will readily understand what the relative proportion of the parts should be."

Patent No. 707,840 to Goldie, dated August 26, 1902 (End of this Brief).

This patent shows a device for blowing cement, although obviously it could be used for concrete in the light of the teachings of Smith's patents, 122,497 and 122,498. This patent has the downwardly-inclined conical chamber 16 and a delivery pipe 13. Compressed air is introduced through the pipe 17 into the bend of the delivery pipe 13. A jet of water may be introduced through the pipe 20 if desired.

In this Goldie patent, it is taught that in mechanism for pneumatically blowing materials, *the introduction of compressed air on top of the materials in the chamber 16 is not necessary*, but that with mobile or fluent materials, such as the cement, sand and gravel referred to

(p. 3, lines 6-9) the operation can be successfully performed by blowing a single stream of compressed air or steam into the bend of the delivery pipe 13 in the direction of conveyance of the material. While Goldie shows only a short pipe, he uses high pressure to drive the material into the interstices of the ballast, and that pressure would drive it through a long pipe. The length of pipe through which the material is blown is merely a question of intensity of air pressure.

It is true that the Goldie patent does not describe the "blowing" of concrete by his device, but to blow concrete through the Goldie device in view of the two Smith patents 122,497 and 122,498, would be merely a change of materials, for which there is full instruction in the prior art as previously set forth. Goldie's prior patent 676,128, mentioned on the first page of this patent, describes the use of liquid cement (Goldie, 707,840, p. 1, lines 40-53), for the same purpose. It will be noted that on page 3, beginning line 6, Goldie describes the blowing of *cement mixed with sand or gravel*, which with water are the constituents of concrete. In this paragraph he describes blowing water in through the pipe 20 *to mix all the ingredients in the delivery pipe*. This is identically the same process as that described in the patent in suit (R. 285, 286) and discussed quite fully elsewhere herein.

The remaining patents need not be discussed in detail. The McIlvrid patent 958,421 shows a tank 1 with a delivery pipe 16 and one compressed air pipe 13, and has the improvement of a mechanical stirrer within the tank. This machine is for blowing grout, which contains water, sand, cement, and often gravel and small stones (R. 325, lines 8-14). This patent also disclosed the idea of simultaneous mixing and blowing, and issued one year before that

theory was inserted in the McMichael application as new matter. To make the pipes larger to transport larger stones is certainly not invention. All the remaining prior patents are supporting and corroborative of all we have said concerning the prior art and need not be referred to in further detail, but their bearing will be understood from the foregoing argument.

Application of the Foregoing Prior Art to McMichael's Patent.

From the consideration of the foregoing prior art, it will be clear therefrom that prior to McMichael:

1. The pneumatic "blowing" of all kinds of liquid, particulate and other fluent or mobile materials was old and well-known (shown by all the prior art).

2. "Blowing" any of said materials by an apparatus comprising a chamber having a downwardly inclined bottom portion, and discharging into a delivery pipe was likewise old (shown by all the prior art).

3. It was old to apply compressed air in any one of three ways to "blow" the material, as follows:

3-a. By introducing the compressed air *only* on top of the material within the chamber (Smith, 122,498);

3-b. By introducing the compressed air on top of the material within the chamber *and* introducing a second stream of compressed air into the bend of the delivery pipe in the direction of travel of the material (Beach, Farnham and Warren);

3-c. Using only the bottom stream of compressed air introduced into the bend of the delivery pipe and in the

direction of the flow of the material, there being no compressed air introduced directly into the chamber (Goldie).

McMichael's patent is merely a copy of, or a selection from, the prior patents. These had become practically standard and were common property. Obviously, McMichael cannot have a valid patent for this old and well-known structure, and it is likewise quite clear from the record that petitioners-defendants do not use anything more than, or different from, this old and common standard type *which is free to all.*

This judgment of invalidity is made legally necessary on any one of several separate grounds, to wit:

1. The McMichael patent is invalid in view of the Smith patents 122,498 and 122,497 (R.297-304

2. The McMichael patent is invalid in view of the Smith patents and the disclosure in the other patents, such as Beach, 267,318; Farnham, 747,396, or Warren, 671,303, of introducing a second stream of compressed air into the apparatus generally.

3. The McMichael patent is invalid in view of the Farnham patent, or the Beach patent, or the Warren patent, and the teachings of all the prior patents, that any kind of fluent or mobile material, including liquid concrete, can be blown pneumatically in a standard mechanism of this general type.

4. In other words, McMichael has simply taken the disclosure of the Smith patents, that liquid concrete could be placed in an air-tight chamber having a bottom delivery pipe, and having a compressed air supplying pipe so as to put pressure on the top of the material in the chamber to blow it pneumatically through the delivery pipe to a place of delivery. He utilized a second com-

pressed air supplying pipe as disclosed in the patents as Beach, Farnham, Warren and Goldie, which had already shown that a second compressed air stream might be used if desired. *And that is all that McMichael has actually done.*

III. Respondent Does Not Use the Mechanism of Their Own Patent.

The commercial form of respondent's device is shown in the record in the *Ulen* suit, pages 184 and 194 "Plaintiff's Exhibit No. 5" and "Defendant's Exhibit B." It is not constructed according to the McMichael patent, but in accordance with the prior art, *as the second compressed air pipe is introduced into the bend of the delivery pipe.* In that mechanism, Defendant's Exhibit E, the receiver A communicates with the delivery pipe D, the compressed air is admitted on top of the material in the chamber A through the pipe E, and two streams of compressed air are supplied through pipes F and H *into the bend C of the delivery pipe.* On page 184 there is one compressed air pipe B discharging *into the bend of the delivery pipe.* It will be clear from consideration of this drawing that respondent has abandoned in its commercial machines the form of device shown in its patent, and is using a device having the essential structure of the Beach, Farnham and Warren patents, only modified somewhat in shape. It might be also validly considered that respondent has merely taken the device of the Smith patent, 122,498, and added thereto a second stream of compressed air at the bend of the delivery pipe, as taught in the Beach, Warren, Farnham and Goldie patents.

If McMichael's air pipe 10 discharging air *within* the chamber is an improvement over the prior art, why does

not respondent use it in its commercial machine? It is the only feature peculiar to McMichael over the prior patents. In any event, commercially, respondent is using the prior art devices (Ulen R., Exhibit D, pp. 184, 194) and not the patent in suit.

IV. *The Concrete Appliances Company* v. *Gomery* Decision.

The decision in *Concrete Appliances Company* v. *Gomery*, 269 U. S. 177, we submit, is the governing law of this Court in this case. The chief bearing of this decision on the present case is that it lays down the principle that in the art of conveying liquid, or particulate, or other fluent or mobile materials of all kinds, *any* devices previously employed to convey *any* of these materials will be obviously applicable to convey *some other kind of said materials*, and such extended use is a mere matter of selction, and does not amount to invention. We quote from that decision as follows:

> "It is a fact of which we may take judicial notice (King *v.* Gallun, 109 U. S. 99, 3 S. Ct. 85, 27 L. Ed. 870) that the principle of conveying and distributing a mobile substance by gravity has found exemplification for centuries, in apparatus for lifting water by power, in buckets or other convenient form of conveyor to a central reservoir from which its flow is induced by gravity, *through* suitable *conduits* to fixed points or through *movable pipes* or hose to *varying selected points*. Long prior to the Callahan application the principle had been applied to other substances capable of flow under the action of gravity, *such as grain, coal, crushed stone, sand, and iron ore.*
>
> * * * * * * *

"In this state of the art, Callahan and several others, in the period 1909, applied for patents on combinations for the conveying of wet concrete through spouts or chutes; their applications resulting in interferences.

"Without more extensive examination of the record, this state of the proof leads us irresistibly to the conclusion that the combination described in the Callahan application does not constitute an invention.

"The observations of common experience in the mechanical arts would lead one to expect that, once *the feasibility of using 'wet' concrete in building operations was established, the mechanical skill of those familiar with engineering and building problems would seek to make use of known methods and appliances for the convenient handling of this new building material.*

"To say nothing of the universally known methods and appliances for raising and distributing water, there were ready at hand widely used and generally understood appliances for the *elevation and distribution of mobile substances*, such as *grain* and *coal*, which involved, both in principle and in practical detail, all the elements described in the Callahan claims. *Failure to make use of these obviously applicable methods and appliances in combination, suitable to the particular work in hand, in dealing with a new, plastic material capable of similar treatment, would, we think, have evidenced a want of ordinary mechanical skill and of familiarity with construction problems and methods.* The adaptation independently made by engineers and builders of these familiar appliances to the movement and distribution of concrete cement in building operations and the independent patent applications, within a comparatively short space of time, for devices for that purpose are in them-

selves persuasive evidence that this use, in combination of well known mechanical elements was the *product only of ordinary mechanical or engineering skill and not of inventive genius.* Atlantic Works *v.* Brady, 107 U. S. 192, 2 S. Ct. 225, 27 L. Ed. 438. It is but 'the suggestion of that common experience, which arose spontaneously and by a necessity of human reasoning, in the minds of those who had become acquainted with the circumstances with which they had to deal.' Hollister *v.* Benedict Manufacturing Co., 113 U. S. 59, 72, 5 S. Ct. 717, 724 (28 L. Ed. 901). *This progressive adaptation, much of which preceded and some of which was contemporaneous with the Callahan adaptation, of well-known devices to new but similar uses, 'is but the display of the expected skill of the calling, and involves only the exercise of the ordinary faculties of reasoning upon the materials supplied by a special knowledge, and the facility of manipulation which results from its habitual and intelligent practice.'* Hollister *v.* Benedict Manufacturing Co., *supra*, at page 73 (5 S. Ct. 724). *No novel elements were used by Callahan in his device.* We are unable to find that their use in combination in it was more than the application to them of mechanical skill in the course of a natural development and expansion of the art." (Italics ours.)

In view of this decision, all of the prior patents discussed, each considered by itself, is analogous and relevant prior art with respect to the McMichael patent. In other words, we have shown that, beginning with the Smith patent 122,498, the prior art, considered by itself in its successive and simple development, discloses and teaches everything *of substance* disclosed in the McMichael patent and warrants invalidation of that patent. Any of these patents which discloses the chamber, the de-

livery pipe and the two compressed air pipes, when considered by itself, is an anticipation of the McMichael patent.

V. Petitioner-Defendant's Device and Practice.

Defendant's device is shown at page 382, Record, Plaintiff's Exhibit No. 4, and comprises the chamber without reference character, and has a compressed air pipe 24 delivering a stream of compressed air into the bend of the delivery pipe P. There is also a compressed air pipe 27 adapted to deliver compressed air into the upper part of the chamber, *but which was not used by petitioner.* Plaintiff's Exhibit No. 5 (R.294 is an outline drawing of a portion of the same mechanism, showing the threaded opening for connecting the compressed air pipe in the bend of the delivery pipe, to introduce a stream of compressed air at that point blowing in the direction of travel of the material.

As built and originally installed, petitioner-defendant's device had the pipe 27 by which compressed air could be blown into the chamber on top of the concrete or other material therewithin, in addition to the pipe 24 to blow compressed air into the bend of the delivery pipe P. As a matter of fact, in actual practice, after the first few days of experimentation with the device, petitioner never used the top air, as it was found that with liquid or fluent concrete the top air was not only unnecessary but was actually detrimental. In either condition it is merely an utilization of the devices of the prior patents.

The facts concerning the operation of petitioners-defendants' machine are clear from the record. See R. 201-207, 230-1, 245-6 for testimony of Kennedy, Swartz and Dyer.

It is clear from this testimony of these three witnesses that defendant's device was operated in all actual work by using only the bottom pipe to blow compressed air only into the bend of the delivery pipe, and no air was blown into the chamber on top of the material. That is, defendants-petitioners' device operated substantially the same as Goldie patent 707,840.

We submit that it is proven by preponderance of the evidence that defendants' petitioners did not use the top air; we submit that this question is neither determinative nor important in the present case. It is clear that *whether or not petitioners-defendants used the top air, in either case they were but using the standard devices of the prior art which were free to all,* whether these devices be considered simply in the light of the continuous development of the art, or whether they be considered in the light of the decision of this Court in *Concrete Appliances Co.* v. *Gomery,* 269 U. S. 177.

Even considering the top air as being used, petitioners-respondents are merely using the device of Beach patent 267,318, Farnham patent 347,396 or Warren patent 671,303, with some slight changes in the proportion of the pipes. Furthermore, petitioners-defendants utilize the method of blowing *liquid concrete* disclosed in Smith's patent 122,498 and the general mechanism of Smith 122,498, namely, the container F, the delivery pipe D, and the top compressed air pipe *f* of Smith, and added thereto a second compressed air pipe blowing *into the bend of the delivery pipe and in the direction of travel of the material in that pipe,* as is taught by Beach, Farnham and Warren, *and which is not disclosed in the McMichael* patent. It is clear, therefore, that even when and if petitioners-defendants used the top air in addition

to the compressed air entering the bend of the delivery pipe, they were merely using the devices of the prior art which are free to all. When petitioners-defendants' device was operated in this manner, that is, with the upper compressed air supply cut off, its structure and manner of operation were practically identical with that of the Goldie patent, 707,840, which has the conically downwardly-decreasing chamber 16, the delivery pipe 13, and the compressed air pipe 17 delivering a single stream of compressed air into the bend of the delivery pipe and in the direction of travel of the material.

VI. The "Slug" Theory of the McMichael Patent.

In all the litigation which has been based on this patent, the *Ulen* suit in 1923, this present suit, and that brought in the Western District of the State of Washington, the plaintiffs-respondents have relied upon the so-called "slug" operation of the McMichael patent. This theory was first introduced into the application for that patent by amendment on January 24, 1911 (Ulen Record, Exhibit D, pp. 219-226), and is not even remotely suggested in the application as filed. It is to the effect that in the McMichael patent the concrete is not blown through the pipe by the *current* of compressed air, but that concrete is used which is "relatively compact and impervious to air" (R. 285, lines 62, 63). This "dry" concrete forms into air-impervious slugs or cylinders, with which no air is intermixed, but the total air pressure is on the back end of these successive integral slugs or cylinders of concrete, and pushes them along through the pipe by this back pressure (Ulen Record, Exhibit D, p. 49, fol. 145; p. 50, fols. 148-9; p. 127, fol. 381; pp. 128, 129).

From a study of the cited passages from the Ulen record, it will be clear that the entire case of plaintiffs was based on this slug theory, *i. e.*, that the air pipe 10 by "powerful jets" cut off slugs or cylinders of concrete, and these were blown integrally through the delivery pipe.

This imaginary cutting off and propulsion of imaginary "slugs" or segments, was pronounced by the district court to be "invention of a high order." *Vide* 12 Fed. (2) 931, as follows:

> "The appreciation by the inventor of the necessity of limiting the concrete to be conveyed to sections of moderate size and weight, and *his method by the second air jet of securing the cutting off of a segment from the mass of concrete and a propulsion of this segment through the discharge pipe*, involves invention of a high order."

That is, the *Ulen* suit was won on the imaginary and impossible "slug" theory. The Court of Appeals for the Second Circuit affirmed without opinion. 12 Fed. (2) 931. The suit was won on this impossible "method," *not mentioned in the specification as filed, but introduced four years later, as an entirely foreign inventive principle*, and rendering the patent invalid by reason of this "new matter."

This theory is remarkable in various respects. It is remarkable for its originality, for its impossibility, its manifest inoperativeness, and the *total absence of any disclosure of it from the McMichael application as filed on January 14, 1907*. This "slug" theory was first introduced into the application (Ulen Record, Exhibit D, pp. 196, 283) by amendment D filed on January 24, 1911 (four years after the McMichael application had been filed) and further elaborated by amendment F, filed on March 29,

1913. The new matter inserted by these two amendments comprises the greater part of the specification, *i. e.*, almost all of the matter on pages R.285 R.286 and the remainder of the specification on R 287.

An example of the statements introduced into the McMichael application in 1911 and 1913, as to the merits of the imaginary "slug" operation (R.285 lines 73-80) is as follows:

> "This action (*i. e.*, the slug making action) of the two air bodies in my apparatus is to be contrasted with the action of air in earlier devices which are so constructed that light materials such as grain or ashes could be caught in large moving air bodies and carried along in suspension with each particle separated from the others."

Judge BOURQUIN in his decision in the suit in the Western District of Washington (23 Fed. [2] 131, 133), after giving more careful consideration to this "slug" theory, said:

> "Adverting to the third of plaintiff's contentions, the first observation is that the slug theory is not proven and is untenable. With 100 pounds of air from the primary upper air pipe behind it, *the concrete stands not on the order of its going, but goes at once*, and through the discharge pipe 'with great rapidity and speed.' *In these circumstances, the upper air does not halt until the lower air has neatly cut off and removed a slug of concrete, nor does the lower air, of like pressure from the common reservoir, halt until within the field of its activity has been projected sufficient concrete to form any slug.*
>
> "In the nature of things, the patent now stipulating what the application originally did not, viz.: simultaneous and constant application of both up-

per and lower air, the lower air can but some disintegrate and aerate the mass of concrete as it rushes by, and thereby lubricate, lighten, and assist its flow through the conduit. The lower air but joins and flows in the same direction and with the stream of concrete. It may be that, if the upper and lower air were alternately applied, some quasi slug action would follow, akin to the action of Sounders' 'air-lift pump,' patent 597,023 of 1896, *but not when simultaneously applied as here.*

"Taking McMichael as it is, *to expect or secure movement of the concrete in alternate slugs of concrete and air would do violence to the laws of nature and confound reason. It cannot be done.* Moreover, the proof is clear, by plaintiff's witness as by defendant's, and some who are interested in plaintiff, that the concrete discharges in a continuous aerated or mixed stream of concrete and air, and not at all in any slug formation."

In other words, it is preponderantly clear that McMichael's device operates the same as does *all* those of the prior art. It is, therefore, invalid in view of the prior patents.

To harmonize with this complete shifting of ground by Amendment D, filed January 24, 1911, other significant changes in the specification as originally filed were made. The statement of invention in the preamble of the specification, as originally filed (Ulen Record, Exhibit D, p. 199), reads as follows:

"This invention relates to apparatus for *elevating* and transporting *granular and plastic building material, such as sand, plaster, mortar and concrete.*

"The invention has for its object to provide an apparatus for elevating and transporting material of the character mentioned in a more expeditious

manner and with greater facility than is possible by the employ of ordinary methods."

(The words in italics in the just quoted passage were *cancelled* by amendment B, filed January 24, 1911.)

By that amendment, and later amendments, this statement of invention was changed (R. 284 to read as follows:

"This invention relates to A METHOD OF AND an apparatus for transporting AND TREATING concrete.

"The invention has for its object to provide A METHOD OF AND AN apparatus for elevating and transporting material of the character mentioned in a more expeditious manner and with greater facility than is possible by the employment of ordinary methods AND MECHANISMS."

(The words in caps were INSERTED by these amendments.)

It will be noted that in the application as filed, McMichael stated that his device was adaptable for transporting "*granular and* plastic building material, such as *sand, plaster,* mortar *and* concrete."

In other words, McMichael's original statement of invention was absolutely in accord with (1) the disclosures and evidence of the prior art taken by itself, and (2) absolutely in accord with the decision of this Court in *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177. It is very clear that mechanism and methods for blowing concrete are equally and efficiently applicable to granular and plastic materials, and a device which will "blow" sand or wheat or ashes, will also "blow" concrete, and *vice versa.* These changes in McMichael's specification were made, apparently, in part at least, in an attempt to

escape from the devastating effects of the prior art. *It must be recalled in this connection that the Patent Office did not find the Smith patents 122,497 and 122,498, which are the closest prior art.*

In McMichael's application as filed, there is not one word of disclosure (1) as to the (imaginary) slug method of blowing concrete; but (2) a very clear disclosure that the "blowing" of concrete is the same both as to apparatus and method as other granular and plastic materials.

Testimony of Kirkland on This Point.

Another very illuminating feature, tending most persuasively to show that the McMichael apparatus operates like all the other devices of the prior art, whether for blowing concrete, grout, sand, grain, or what-not, is the testimony of plaintiff-respondent's chief engineer.

Mr. H. B. Kirkland became chief engineer of the respondent's corporation about 1913 (R.109-10, and from that time has had complete charge of the installation and of instruction of workmen in the operation of respondent's blowers (Ulen Record, Exhibit D, pp. 43, 45). In the next six years, due to his wide and exclusive experience with this machine, Mr. Kirkland became an authority as to the manner and principle of its operation.

On May 13, 1918, he delivered an address before the Western Society of Engineers, which was published in the Journal of that Society for May, 1918 (Defendant's Exhibit H), which was copyrighted in 1918, in which Mr. Kirkland described the operation of this machine (after six years exclusive experience in installing and operating the machine (R. 107-8)) as follows:

> "As the portions of the batch drop into the lower air stream, which has a velocity of about 5,000 feet

per minute, these portions are **carried along in suspension much as dust is carried along in a storm,** except that the particles are much closer together. Although the speed *of the air jet is very high, the speed of the concrete materials is much slower.* The speed of the concrete varies according to the amount of voids in the materials which permit the air to pass through. The air in passing through the voids tends to carry with it the smaller ingredients; that is, the sand tends to fill the voids between the rocks and the cement tends to fill the voids remaining, and as the voids become filled up with the smaller ingredients passing through, the speed of the mass increases, the pressure of the air behind the mass increases with the decrease of the voids in the mass, and the speed of the mass concrete increases.

"Now, in this explanation of the mixing process, I have assumed that the air velocity passing through the pipe **is sufficient to keep the materials in suspension, and it is important to have a sufficient air pressure to keep the materials in suspension,** because when the air velocity is reduced the *materials simply roll and tumble along the bottom of the pipe.* The concrete will also mix in this manner, but it is not conducive to good operation and makes a dirty pipe line, which is liable to become plugged. In shooting concrete, therefore, it will be found that with an 8-in. pipe and with materials of the specific gravity of limestone, the pressure should not fall below 50 pounds, *as the materials will then commence to drag along the pipe.* Any air expended below 25 pounds is wasted when blowing concrete through an 8-in. pipe" (R. pp.107-108

In other words, plaintiff-respondent's chief engineer stated to the Western Society of Engineers in May, 1918, that the McMichael device operates exactly like *all* the patents of the prior art.

In addition to this, in that same address, delivered on May 13, 1918, to the Western Society of Engineers, Mr. Kirkland stated that on the "Diana tunnel" job (Defendant's Exhibit H, pp. 334, 335), with one of plaintiff-respondent's machines, he *alternately blew concrete* into the form, and *blew limestone screenings* (which is in reality very small stones) *and sand* into the cavities between the concrete and the natural rock of the tunnel. His statement on this point is as follows:

> "At the north end of the tunnel the temporary timbering was removed as concrete progressed. Considerable breakage in the roof left cavities of various depths which it was necessary to fill either with concrete or some variety of packing. *Where packing was used it was placed with the [plaintiff's McMichael] pneumatic machine. The packing material consisted of a mixture of 75 per cent. limestone screenings and 25 per cent. sand. This was blown in* filling the cavity completely and packing it tightly so that the weight or any pressure from rock settlement was evenly distributed over the barrel of the arch through the packing."

When called as a witness by the defendants herein, (R. 105-110), he was asked to identify this article, and did so. He was then asked whether he wished to substantiate or repudiate the article. In view of the fact that his employer's entire case was hung on the "slug" theory of operation, Mr. Kirkland *repudiated his statements in the address as to the manner of operation of the McMichael mechanism* (R. 106-8), that is, that it operated kinetically like any other machine for blowing fluent, liquid or particulate materials, *because of the danger of such admission to his employer's case.* Mr. Kirkland is an educated and trained engineer and has had long experience

with the McMichael blower and his statement before the Society of Engineers was made before any suits were brought on the patent, and while he had no incentive to state anything other than the exact facts.

Mr. Kirkland, however, while repudiating the description of the *manner of operation* of plaintiff-respondent's machine, as made by him in the address to the Western Society of Engineers on May 13, 1918, *declined* to repudiate the *statement of the facts* that on the Diana tunnel job he at *one time blew concrete and immediately subsequently blew limestone screenings and sand* with one of defendant-respondent's own machines. Mr. Kirkland was sufficiently astute to appreciate the difference between what might be regarded as opinion evidence and fact evidence. In this case the fact evidence was more convincing and weighty and quite as significant as the opinion evidence.

All these various items of evidence are cumulative and corroborative to show that McMichael's device operates precisely as do those of the prior art, and that it is anticipated and invalidated thereby.

New Matter Illegally Inserted in the McMichael Patent.

Slug Theory of 1911 a Different "Invention."

The change made in 1911 in the statement of invention, eliminating the statement that McMichael's machine would blow either *granular or* plastic material, was concurrent with the introduction of the "slug" theory and that of mixing the concrete while being blown through the pipe. *This is an entirely different "invention" from that disclosed in the application as filed, and renders the patent invalid.*

This expansion of McMichael's application, and the unwarranted importation of Leake's inventive ideas thereinto in 1911 are well stated by Judge BOURQUIN at 23 Fed. (2) 131 and 132. This finding of fact by the District Judge was confirmed by the Court of Appeals at 27 Fed. (2) 839 to 841.

Practically all of pages 2, 3 and 4 of the specification of the printed patent (R. 285-287) constitute new matter inserted either on January 24, 1911 (after McMichael had had access to Leake's application) or on March 29, 1913, and relate to the new method of "treating" concrete, *i. e.*, the "slug" method, and also that of mixing the ingredients to make the concrete while in flight in the delivery pipe. It will be noted that the original specification, as filed, which is practically entirely on page 1 and the first eight lines of page 2 (R. 373), is *substantially of the same scope and subject-matter as the other patents of the prior art for blowing plastic and granular materials.*

There are two new methods and functions set forth in the new matter introduced into the specification partly on January 24, 1911, and the remainder on March 29, 1913, and printed copies of the patent are handed up herewith marked in red ink to indicate the dates and extents of these interjections of new matter, and marked in accordance with Amendment D of January 24, 1911, and Amendment F of March 29, 1913 (Ulen Record, Exhibit D, pp. 219-232 and 256-270).

The two new methods or functions are the "sub-mass" or "slug" theory and that of placing "concrete forming materials" in the chamber and effecting the mixing of the concrete during its flight through the discharge or delivery pipe 13. *There is no hint of either of these methods in the specification as filed.*

The Sub-Mass or "Slug" Theory.

This theory has been the head, front and cornerstone of all the litigation based on this patent. In the litigation it has been usually termed the "slug" theory. It is to the effect that the compressed air pipe 10 emits jets of compressed air and breaks off the concrete in the lower part of the chamber 1 into "sub-masses," and these are then propelled through the delivery pipe in integral "slugs" or cylinders (also called "sub-masses").

The first insertion setting forth this theory was made on January 24, 1911 (Ulen Record, Exhibit D, pages 219-222), and begins at page 2, lines 23-34 of the printed patent (R.285), where it is stated:

> "The lower air pipe 10 which extends to a point immediately adjacent the delivery pipe or discharge duct 13 serves the double function of preventing choking in the entrance to the delivery pipe and of supplying air under pressure *in sharp jets directly to the delivery pipe itself.*"

In that same amendment of January 24, 1911, the novel sub-mass theory, in combination with the concrete making or mixing theory, is further unfolded, beginning at line 80, page 2 (R.285) as follows:

> "• • • One of the strongly marked and novel matters incident to this provision of the pipe 10 for introducing air directly into the discharge pipe, whether considered by itself or considered as supplemental to the agency such as the air from pipe 8 tending to effect downward and forward propulsion of the entire mass, is this, that the rapidly moving air from pipe 10 *acts upon sub-masses successively of the general mass,* at points *near* those where they enter the delivery pipe, the result being that the *thorough commingling* of the ingredients

> (rock pieces, sand, cement and water) well understood by the engineer to be essential to a perfect concrete, can be attained with great rapidity and *with a perfect, uniform distribution of the various ingredients* as concerns the relative positions of all the component particles."

In simple language, this new matter states that the pipe 10 buried in the mass of concrete near the bottom of the chamber 1, emits the air in sharp jets (although there is absolutely no mechanism for effecting this jet action); that these jets pass directly into the pipe 13, and detach sub-masses from the mass of concrete, which is under continuous and equal pressure upon its entire surface, of relatively very great area, from the compressed air from pipe 8, and that this detachment of the sub-masses effects a *thorough and perfect mixing of the ingredients of the concrete*, and cuts it off into slugs or cylinders and pushes these integrally through the delivery pipe. No theory could be more preposterous. As a matter of fact, the air from the pipe 10 comes out *in a steady stream*, and *not* in "sharp jets," and discharges into the mass of concrete, which is already under equal or greater pressure on its surface from the pipe 8. This over-all pressure would prevent any detachment of sub-masses; but even if it were absent, all that the air from pipe 10 would do would be to blow a hole in the concrete in the direction of least resistance (R. 55 One thing is certain, it would not detach sub-masses nor would it cause a perfect mixing of the ingredients as asserted in the passage quoted. See Judge BOURQUIN's decision, quoted following. The soundness of his demolition of this theory will appeal to the common sense of any practical man.

On this point, the Court of Appeals for the Ninth Circuit held (27 Fed. 838, 841):

"*There was no suggestion of a slug theory in the original application of McMichael,* but when the patent was issued, more than eight years later, it was stated in the specifications that the lower air pipe adjacent to the discharge duct 'serves the double function of preventing choking in the entrance to the delivery pipe and of supplying air under pressure in sharp jets directly to the delivery pipe itself.'

"The slug theory was obviously adopted, from expressions found in Leake's application, in which he proposed the use of a combination consisting of two tanks discharging into a single conduit alternately, by means of which the main body of concrete 'can be detached in portions and blown into the conduit and driven along the same.' *Such a result might be accomplished by the use of his combination, but it is not apparent that any slug action occurs in the use of either the McMichael* or the Hackley combination. In neither is there *intermittent pressure, or 'sharp jets' of air, and in both there must necessarily be exerted a steady and continuous force from the upper and the lower air nozzles, combining to drive forward the concrete and deliver it in a practically unbroken stream,* and if, indeed, a temporary obstruction of material at the exit should occur, it is not believed that its release would result in a slug action, or a constantly intermittent propulsion of concrete, or that, if such an intermittent action could in practice be accomplished, any advantage would thereby be attained. The decided weight of the testimony is to the contrary."

On this point the District Judge held (23 Fed. 133-4):

"Adverting to the third of plaintiff's contentions, the first observation is that the slug theory is not proven and is untenable. With 100 pounds of air

from the primary upper air pipe behind it, *the concrete stands not on the order of its going, but goes at once*, and through the discharge pipe 'with great rapidity and speed.' *In these circumstances, the upper air does not halt until the lower air has neatly cut off and removed a slug of concrete, nor does the lower air, of like pressure from the common reservoir, halt until within the field of its activity has been projected sufficient concrete to form any slug.*

"In the nature of things, the patent now stipulating *what the application originally did not*, viz., simultaneous and constant application of both upper and lower air, the lower air can but some disintegrate and aerate the mass of concrete as it rushes by, and thereby lubricate, lighten, and assist its flow through the conduit. The lower air but joins and flows in the same direction and with the stream of concrete. It may be that, if the upper and lower air were alternately applied, some quasi slug action would follow, akin to the action of Sounders' 'air-lift pump,' patent 597,023 of 1896, *but not when simultaneously applied as here.*

"Taking McMichael as it is, *to expect or secure movement of the concrete in alternate slugs of concrete and air would do violence to the laws of nature* and confound reason. It cannot be done. Moreover, the proof is clear, by plaintiff's witness as by defendant's, and some who are interested in plaintiff, that the concrete discharges in a continuous aerated or mixed stream of concrete and air, and not at all in any slug formation."

The four Judges in the Ninth Circuit were unanimous in condemning this slug theory as impossible and fantastic. In any event it is entirely new matter in the McMichael application. All of plaintiff's litigation has been based upon it, and without it the McMichael patent can-

not be construed as anything more than what it *frankly stated itself to be in the original application*, namely, a device for blowing either granular or plastic material, *exactly like all the other blowers of the prior art.*

Returning now to further consideration of the new matter in the amendment of January 21, 1911, the specification proceeds (R.285 beginning line 100) with a discussion of the nature of concrete, and the difficulties and requirements of proper mixing. The specification goes on for the length of a column, and purports or assumes to show that both mixing with shovels by hand, and in the ordinary rotary mechanical mixer (R.286, line 21, *et seq.*) is imperfect. After concluding this dissertation, the description of the alleged and imaginary perfect mixing of the ingredients while in flight in the delivery pipe of the McMichael patent is set forth on page 3 of the patent (R.286 lines 69-94), where it states that either the entire operation of properly mixing the concrete ingredients (*i. e.*, stone, sand, cement and water) or the completion of a preceding partial intermixture is effected by the "powerful jets of air or fluid agent introduced through the pipe 10 as above described * * *". It is preposterous that unmixed cement, sand, stones and water will mix more perfectly while blown through a pipe by an air blast traveling 5,000 feet per minute than in the ordinary mechanical rotary mixer, which is probably familiar to everyone.

This is the method of "treating" concrete which is mentioned in the succeeding claims which will be later discussed. It will be noted that to effect the division into sub-masses and to effect this ideal and perfect intermixing of the previously unmixed or partially mixed stone, sand, cement and water to form perfect concrete, it is

necessary that there be powerful jets of "air of fluid agent" discharged *into the mass of concrete within the chamber*, and directed from within the chamber and within the mass towards the receiving end of the delivery pipe. Well does Judge BOURQUIN comment that it "would do violence to the laws of nature and confound reason. It cannot be done."

This is all that there is to the patent in suit. Otherwise, it is, as it frankly purported to be when filed, only one of the common class of devices for blowing either granular or plastic materials in the usual manner. As to this new and fantastic sub-mass and concrete-mixing theory, these facts are clear:

1. It is entirely new matter, originating in the application on January 24, 1911, four years after the filing of the application.

2. There are no means disclosed either in the application as filed, or as changed by the insertion of the new matter, to produce powerful jets of air from the pipe 10, or any intermittent and alternate action of air pipes 8 and 10.

3. As unanimously stated by the four Judges in the Ninth Circuit, it is absolutely inoperative.

4. There is absolutely no proof whatsoever that the petitioner has ever used it, but the proofs show preponderantly that petitioner has never used this method.

The testimony of Mr. Frank L. Dyer, the expert (R. 243-7), and of Mr. John J. Kennedy, Chief Engineer for the petitioner (R. 206-7), is conclusive that petitioner's machine does not operate by the imaginary slug method. The *four* Judges of the Ninth Circuit state that they are convinced that respondent's machine does not operate by

the slug method (23 Fed. [2] 134; 27 Fed. [2] 841); and the two majority Judges of the Second Circuit Court of Appeals stated that they do not know how it operates (27 Fed. [2] 670, final paragraph). See also, Artingstall (R. 92-96). The great preponderance of evidence, as well as the dictates of sound common sense, brand the "slug" method as imaginary.

Present Suit Based on Soundness of Slug Theory.

In the brief before the Court of Appeals for the Second Circuit (p. 4) respondent stated:

> "The operation of an apparatus made according to the patent and operated according to the method therein defined *produces the peculiar result of first pressing the concrete mass into the outlet and packing it there, then cutting off successive sub-masses or slugs at the outlet, and then propelling these masses or 'slugs' in quick succession through the delivery pipe to the distant point of placement.*"

Respondent is on either horn of the dilemna:

Either the slug method is non-existent (as Judge Bourquin clearly shows it must be where a single steady of continuous second stream of air is used)

Or, the entire McMichael patent is invalid as depending entirely on new matter illegally inserted in the application *four years* after filing.

If the slug method is imaginary, McMichael's device confessedly operates the same as all the prior patents, and is invalid.

If the "slug" theory be correct, the patent was rendered invalid by the introduction of the new matter on January 24, 1911.

Prior Knowledge and Use in This Country.

Section 4886 of the Revised Statutes provides that if any invention is known or used in this country, before the date of the patentee's conception of the invention, his patent is invalid.

Section 4886 is, in part, as follows:

> "* * * not known or used by others in this country, before his invention or discovery thereof. * * *"

As this litigation comes before your Honors, the *Powers-Kennedy Contracting Company* v. *Concrete Mixing & Conveying Company, No. 501*, and *Concrete Mixing & Conveying Company* v. *R. C. Storrie & Company, No. 528*, October Term, 1928, both involve the same McMichael Patent 1,127,660, and have been ordered heard together, so that, in effect, they are one appeal.

We will, therefore, refer not only to the record in 501 but also to the record in 528, using only the findings of fact set forth in the decision of the Circuit Court of Appeals for the Ninth Circuit (*Davis* v. *Schwartz*, 155 U. S. 631, 636).

Entirely regardless of the prior patented art, previously discussed in this brief, the McMichael patent is invalid under Section 4886 of the Revised Statutes because the alleged inventions was,—

> "* * * known or used by others in this country before his invention or discovery thereof * * *" (R. S. 4886).

There were at least three prior uses in this country before January 14, 1907, the date on which McMichael filed his application, and as no testimony was presented by him or his assignees, of any earlier date of invention,

he is under the law limited in both Nos. 501 and 528, to that date, to wit: January 14, 1907.

While McMichael's application was pending in the United States Patent Office, it was put into an interference with,—

(A) an application of Leake, filed October 7, 1907, some nine months after the date that McMichael filed his application. This application of Leake was later assigned to the respondent, Concrete Mixing & Conveying Company, for a consideration of six thousand ($6,000) dollars. The interference between Leake and McMichael appears to have been, after the purchase of the Leake application, a friendly affair, being settled by the parties without taking testimony to determine priority as between these two parties, and, of course, without a decision by the Patent Office on such testimony. The Leake application was assigned to this respondent, and patented on February 13, 1917 by Patent No. 1,215,558.

(B) The other application in the interference was filed by William W. Darley, who had applied for a patent on "apparatus for handling ashes and other materials," showing that the Patent Office considered blowing "ashes and other materials" as being the same invention as blowing concrete.

Darley's pleadings, or what is known in the Patent Office as a preliminary statement, in which he set forth his dates of invention and other data, did not antedate the filing dates of McMichael and Leake, so that on the record, without any testimony having been taken, and simply on the pleadings, a judgment was entered

> "that Darley is not the first inventor" (Ulen Record, p. 214).

He being eliminated, the interference was continued between Leake and McMichael, the interference being subsequently settled by payment to Leake of $6,000, without taking testimony, or having the Patent Office make any judicial decision on any evidence, as to which of these parties was the prior inventor. In this settlement, Bliss, the attorney for the respondent, Concrete Mixing & Conveying Company, became the assignee of the Leake application, subsequently assigning the application to the respondent, to whom the Leake patent was issued. It is reasonable, therefore, to assume that the respondent, Concrete Mixing & Conveying Company, was the real purchaser of the Leake application, and this was the holding of Judge BOURQUIN in 23 Fed. (2) 131 (Appendix to our Petition for Certiorari, p. 32) and of the Court of Appeals for the Ninth Circuit in 27 Fed. (2) 838 (said Appendix, p. 43).

(As all the decisions on this patent are printed in the appendix to our Petition for Writ of Certiorari, we will hereinafter, for the convenience of the Court, refer to the page of this appendix.)

Prior Use in New Orleans and Chicago by Leake.

The prior use in New Orleans and Chicago was in 1905, whereas McMichael did not file his application until January 14, 1907, which, in the absence of any rebuttal proof or testimony carrying his date of invention back of his filing date, is the date of his invention. The only reasonable assumption is that no such testimony was presented because he had none to present. If he, or his assignee, the respondent, did have such evidence, they would obviously not have paid Leake $6,000 for his application in interference with McMichael.

This prior use was by Leake, and is in Case 528.

In support of Leake's testimony of prior use in 1905, it is to be noted:

(a) He testified, reluctantly, on the witness stand, against his assignee;

(b) He filed on October 7, 1907, only some nine months after McMichael, his application, now Patent No. 1,215,558, which is documentary evidence;

(c) That to get control of his invention, McMichael, in interference with him, bought his invention for $6,000. If McMichael, or the respondent, his assignee, could have proved earlier dates of invention, they would not have paid this relatively large sum of $6,000, as it would have been totally unnecessary, for, if McMichael could prove earlier dates, he would have been awarded the patent, or claims, without paying Leake anything.

(d) Respondent took no rebuttal evidence in the Ninth Circuit suit to contradict Leake.

The Court of Appeals for the Ninth Circuit stated:

"There was no denial of the truth of his testimony." (Appendix, p. 49.)

Decisions on Prior Use by Leake—In New Orleans and Chicago.

As to the prior uses by Leake in New Orleans and Chicago:

Judge BOURQUIN held:

"For the purposes of interference, to McMichael the Commissioner suggested four claims, including

the claim aforesaid verbatim from Leake, which McMichael promptly accepted as substitutes for his six, thereupon canceled by him. *The interference was not concluded,* for that plaintiff became assignee of both applications." (Appendix, p. 31.)

Again on page 40 of the Appendix:

"* * * but, as between them, in its present aspect *in McMichael it is the idea and method of Leake, and not McMichael,* in that, prior to McMichael, Leake had conceived the idea, *and in 1905 in New Orleans had publicly and successfully employed it in concrete building operations.*

"For, despite Leake's reluctance to testify against his assignee, the plaintiff, the evidence in quality and quantity *inspires confidence and constrains conviction of the truth of the fact and beyond reasonable doubt.* Neither of them, however, is inventor of the thing. Before them, it was old in the art."

The Court of Appeals for the Ninth Circuit held (Appendix, pp. 47-49):

"It is assigned as error that the trial court found that *Leake* had made the invention in issue prior to the date of McMichael's application. In the opinion of the trial court it is said, 'Prior to McMichael, Leake had conceived the idea *and in 1905 in New Orleans had publicly and successfully employed it in concrete building operations,* for *despite Leake's reluctance to testify* against his assignee, the plaintiff, *the evidence, in quality and quantity, inspires confidence and constrains conviction of the truth of the fact, and beyond reasonable doubt.*' The McMichael application was filed January 14, 1907, and nine months later, on October 7, 1907, was filed Leake's application, which presented everything contained in the McMichael application with the

exception of the U-bend. Leake said: 'The object of my invention is to provide a method and apparatus for preparing a concrete mixture and delivering it while in a plastic condition to the place where it is to be utilized. Another object of my invention is to move plastic concrete from one place to another by means of air pressure.' On May 12, 1909, interference was declared between McMichael and Leake *and Wm. W. Darley,* who had applied for a patent on *'apparatus for handling ashes and other materials.'* Leake and Darley each filed an affidavit setting forth their respective dates of conception and reduction to practice. Darley was dismissed from the interference as being found subsequent in time to the others. Leake's affidavit stated that he 'conceived the invention set forth in the declaration of interference *on or about the 1st day of February, 1905,* that he first made drawings of the invention on or about the 1st day of March, 1905, and first explained the invention to others on or about the 1st day of June, 1905, that he first embodied his invention in a full-sized machine, which was completed *on or about the 1st day of September, 1905, and that on or about the 1st day of September, 1905, the said machine was first successfully operated in the City of New Orleans,* and State of Louisiana, and that he has since made and used other machines embodying the same invention.' Before the interference was declared it was represented on behalf of Leake's application that he had done a large amount of experimental work in connection with his invention. *'He has successfully moved concrete from the place where it is mixed to the place where it is to be used, by means of air pressure, using the apparatus disclosed in his application.'* Again it was said: 'He has given considerable time and thought to this matter and has actually constructed several plants where this is done. *Their operation is highly successful* and

> appears to be a decided improvement over previously known methods for handling plastic concrete.' *But no showing was made or evidence offered to carry the McMichael invention further back than the date of his application* nor was any proceeding had in the Patent Office upon his application until 19 months thereafter *when, for a consideration of $6,000,* Leake assigned his application to McMichael's attorney, who later assigned it to the appellant, which had also become the owner of the McMichael application. The long period of inaction and silence on the part of McMichael, unexplained as it is, *together with the payment to Leake of so large a sum of money as $6,000,* payable, as it was, in annual installments until March 1, 1920, is strongly suggestive of the inference that *McMichael recognized the priority of Leake's invention and could furnish no proof to the contrary.*"

Concerning Leake's testimony as a *reluctant* witness against his assignee, the present respondent, the Court of Appeals stated as follows (Appendix, p. 49):

> "* * * As a *witness* for the appellee in the court below, Leake testified that he conceived the idea of moving concrete as set forth in his application, about February 1, 1905; that he made a container in which to put the concrete and by the means of an air pipe extending therefrom *shot it up on top of a powerhouse then being constructed in New Orleans;* that when the air pressure was applied, the concrete all went up and landed on there; that later he built a commercial apparatus in Chicago and *operated it in conveying dry cinders to the fifth floor of a building.* His testimony, together with his preliminary statement, carried the date of his invention back of that of McMichael and showed an actual *reduction to practice by Leake as early as 1905.* We find no ground for disturb-

ing the trial court's conclusion. The question at issue was, which of two applicants for patent was the inventor? Both presented drawings and plans of the same invention. Leake furnished evidence of the time, place and circumstances of the reduction of his invention to practice. *There was no denial of the truth of his testimony.* In *Armstrong* v. *DeForest Radio Telephone & Tel. Co.*, 280 Fed. 584, 590, it was said: 'While it is true that uncorroborated testimony of an inventor is to be accepted with caution * * * yet there is no rule of law that requires the rejection of the uncorroborated testimony of an inventor as to the date of its conception. The Court must be satisfied as to the fact of the demonstration and that the conception was complete.' In *Reed* v. *Cutter*, 1 Story 590, 596, Mr. Justice STORY said: 'If the invention is effected and put into actual use by the first and original inventor, it is of no consequence whether the invention is extensively known or used, or whether the knowledge or use thereof is limited to a few persons, or even to the first inventor himself.' So in *C. F. Mueller Co.* v. *A. Seregas Sons*, 12 Fed. (2d) 517, 518, considering the question which of two was the real inventor, Judge HOUGH said: The question of invention as between Mueller and Wild is really only one of veracity. There are no presumptions or artificial rules regulating such an investigation, and the evidence of one witness may be sufficient,' citing *Thompkins* v. *N. Y. Woven Wire, etc. Co.*, 159 Fed. 133. That the testimony of one witness may be sufficient in such a case is held in *Mayor* v. *A. & H. G. Mutschler*, 248 Fed. 911, 914, where it was said that one witness may suffice *if the surrounding circumstances are confirmatory.*"

This finding of fact by Judge BOURQUIN, Appendix, page 32, and by the Circuit Court of Appeals for the Ninth Cir-

cuit, Appendix, page 43, of prior knowledge and use in this country before the date of McMichael's alleged invention (January 14, 1907), is based on the testimony, and under the authority of this Court

"* * * *it must be treated as unassailable.*"

Your Honors in *Davis* v. *Schwartz*, 155 U. S. 631, 636, 39 L. Ed. 289, 291, 15 Sup. Ct. Rep. 237 held:

> "1. As the case was referred by the court to a master to report, not the evidence merely, but the facts of the case, and his conclusions of law thereon, we think that his finding, so far as it involves questions of fact, is attended by a presumption of correctness similar to that in the case of a finding by a referee, the special verdict of a jury, the findings of a circuit court in a case tried by the court under Revised Statutes, par. 649, or in an admiralty cause appealed to this Court. In neither of these cases is the finding absolutely conclusive, as if there be no testimony tending to support it; *but so far as it depends upon conflicting testimony, or upon the credibility of witnesses, or so far as there is any testimony consistent with the finding, it must be treated as unassailable. Wiscart* v. *Dauchy*, 3 Dall. 321; *Bond* v. *Brown*, 12 How. 254; *Graham* v. *Bayne*, 18 How. 60, 62; *Norris* v. *Jackson*, 9 Wall. 125; *Insurance Co.* v. *Folsom*, 18 Wall. 237, 249; *The Abbotsford*, 98 U. S. 440."

Your Honors again laid down this law, this time in a patent case, *Adams* v. *Gilliland*, 242 U. S. 350; 37 Sup. Ct. Rep. 169, 170, as follows:

> "* * *, the case is preeminently one for the application of the practical rule that so far as the finding of the master or judge who saw the witnesses 'depends upon conflicting testimony or upon

> the credibility of witnesses, or so far as there is any testimony consistent with the finding, it must be treated as unassailable.' Davis *v.* Schwartz, 155 U. S. 631, 636, 39 L. ed. 289, 291, 15 Sup. Ct. Rep. 237."

Therefore, this entire litigation should be decided against the respondent on the ground that McMichael cannot have a valid patent under Section 4886 of the Revised Statutes, which expressly requires that the alleged invention be,—

> "* * * not known or used by others in this country, before his invention or discovery thereof * * *" (R. S. Section 4886).

Testimony of Prior Use Also in Chicago, in Case 501.

It is really unnecessary to go into the testimony of prior use in Case 501, in view of the testimony of prior use and the decisions supporting it, in Case 528.

The testimony of prior use in Case 501 centers around Exhibit H, which is a printed publication, being the Journal of the Western Society of Engineers of May, 1918, Vol. 23, No. 5, copyrighted in 1918. This was some six and one-half years before any suit was brought by the respondent on the McMichael patent.

Mr. Kirkland, the chief engineer of the respondent, had been installing and using these McMichael concrete blowers for some five years or more, and read an article on the operation of the McMichael concrete blower, before the Western Society of Engineers in Chicago, the article being entitled "The Pneumatic Method of Concreting."

As is customary at such meetings, the engineers at the meeting on May 13, 1918, discussed Mr. Kirkland's address. One of the engineers present, who discussed the paper,

was Mr. William Artingstall. The article as well as the discussion was published and copyrighted in May, 1918, and is, as previously noted, Exhibit H in Case 501.

On page 353 of Exhibit H appears the following:

> "Mr. Wm. Artingsall: The development of the pneumatic mixer is interesting. *About fifteen years ago this device was used in connection with an ordinary mixer as a transporting agent.* The concrete was dumped into the hopper and *transported by air pressure.* The contractor, however, put something over on the engineers. He ran a batch of two through the hopper without putting it through the mixer, and discovered that he had a pretty good mix. From that time on it was dropped until about 1907 or 1908, when the Drake Machine Company, here in Chicago, took it up and started to improve it. We tried it out in the LaSalle Street tunnel. I think that was the first time it was used after 1903. * * * We used this system on account of the convenience more than anything else, but we found we had the best concrete, and we used it practically everywhere we could after that. I think you will find that if the mixers of the present time compare with the ones used at that time, the work will compare favorably with the ordinary mixed concrete work" (R. p47

It was through this article, copyrighted in 1918, that we got in touch with Mr. Artingstall, and found that he was a practicing civil and structural engineer in Chicago, and also employed by the City of Chicago as consulting engineer, the record, showing that the City of Chicago pays him $5,000 a year for a portion of his time.

He remembered the article and the concrete blower which he stated in the discussion in May, 1918, was used in 1903. He was called by the defendant and gave his testimony on the stand (R.32-52 He is a man of high

standing in his profession, and entirely disinterested. He was corroborated by Mr. Fanning, a contractor of ability and experience, who built and operated the concrete machine (R.112-124

Mr. Artingstall fixes the date when he saw this pneumatic concrete blower laying the floor in 177 East Monroe Street, Chicago, Illinois as in 1903, because it was prior to his marriage on June 18, 1904 (XQ263, R. 103). *This coincides with his statement in the discussion of Mr. Kirkland's article in the Journal of the Western Society of Engineers in 1918 that it was about 15 years earlier that he saw concrete blown by air,* in the manner stated in Mr. Kirkland's article. Mr. Fanning was called and corroborated Mr. Artingstall (R.112-140 as to the use of this pneumatic blower in laying the concrete floor at 177 East Monroe Street, Chicago, Illinois.

This evidence of prior use, unlike the evidence of prior use in Case 528, respondent attempted to rebut. Several witnesses were called in rebuttal and at least one of them, Ericson, was proved on cross examination unworthy of belief on a matter wherein he could not have been mistaken (R 148,149; 197,198 The other rebuttal testimony was also, in the opinion of your petitioners, of no weight. Lynch swore (R.184 that he inspected the work and reported personally to Ericson, as City Engineer, twice a week during 1902, 1903 and 1904. Ericson was forced to admit he did not hold the office during that time. With the exception of the testimony of Slade, who produced a written document, Plaintiff's Exhibit No. 15, being a copy of his report on the inspection of the building at 177 East Monroe Street, dated January 23, 1904, which date was prior to the concreting of the floor, he testified that the floor was concreted the following June or July, 1904 (XQs160, 161, R. 169.

The production of this witness with this documentary evidence, Plaintiff's Exhibit No. 15, and his hostile testimony based thereon, conclusively proved that this floor was concreted in June or July, 1904. In the light of this documentary evidence, Artingstall and Fanning were recalled and testified that in view thereof, the floor must have been concreted in June, 1904, which corresponds with the documentary evidence and corroborates the testimony of plaintiff's hostile witness Slade.

The fact remains that in Case 501 the testimony of Artingstall and Fanning is based on the following documentary evidence:

> (a) Exhibit H, Journal of the Western Society of Engineers, published in May, 1918, some six and a half years before any suit was brought under the McMichael patent, and *at which time* Artingstall stated that he had seen such a concrete blower in use "about 15 years ago."
>
> (b) Plaintiff's Exhibit No. 15, dated January 23, 1904, and the testimony of the hostile witness, Slade, that the floor was concreted in June or July, 1904, fixing the dated of the prior use 14 years before Kirkland's article before the Society of Western Engineers, instead of 15 years before.

There were, of course, no contemporary sketches produced by Artingstall or Fanning. Had there been, that very fact would have been suspicious. They made drawings from memory (Fig. 2 of Exhibit E and Exhibit I) of the machine, which was substantially the same as the Warren and Farnham patents.

This concrete blower used in 1904 was built by Fanning for Jackson, and Clark, chief draftsman for Jackson, tes-

tified it was Jackson's practice to build many machines without making drawings (R. 195-6 Notwithstanding this explanatory testimony of Clark, a hostile witness, the testimony of prior use in 501 was held insufficient both by the Trial Court and on appeal because no contemporary drawings or sketches were introduced in evidence.

But entirely regardless of such testimony in 501, the prior use testimony in 528 is conclusive that Leake used the alleged invention in New Orleans and in Chicago, Illinois, in 1905, and applied for a patent only a few months after McMichael's application was received in the Patent Office; and that his testimony in 528 was unrebutted and uncontradicted; and is now, under the decisions of this Court "unassailable." *Adamson* v. *Gilliland*, 242 U. S. 350; 37 Sup. Ct. Rep. 169, 170; *Davis* v. *Schwartz*, 155 U. S. 631; 15 Sup. Ct. Rep. 237.

Errors in the Decisions in the Second Circuit.

From the opinion of the Court of Appeals for the Second Circuit, Chief Judge MANTON dissented. Judges LEARNED HAND and SWAN joined to affirm the decision of the District Court, the opinion being written by Judge SWAN. The majority of the circuit judges reached their agreement to affirm the District Court through a series of errors, which we will consider now in several details.

The first error of the majority of judges was in their consideration of the meaning of the decision of this Court in *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177, wherein they held:

> "The new matter is, of course, open to us and will be dealt with hereafter. The Supreme Court case, however, contains nothing, in our opinion,

> which casts doubt upon the correctness of the Ulen decision; in fact, it was before us when that decision was made. It holds, affirming the judgment of the Circuit Court of Appeals for the Third Circuit in 291 F. 486, that the Callahan patent, which covered an apparatus operating on the gravity principle for distributing 'wet' concrete, was invalid, because it merely made use of known methods and appliances for the convenient handling of this recently accepted building material. The appellants' argument runs that, since the Supreme Court emphasizes that old apparatus used for distributing water, grain, or coal was readily adaptable for handling concrete, so the prior art patents for blowing sand, grain, or grout, which in the Ulen case were held not to invalidate McMichael's patent, should now be deemed complete anticipations of it. But the Gomery decision does not rest merely on the assumption that apparatus for coal and grain could have been used for wet concrete without inventive thought. *Adaptations of old carriers to handle concrete were shown to have been frequently made for several years before the application for the patent there in suit.* The idea was already of common knowledge and was being applied generally. Therefore Callahan's adaptation was not an invention."

The majority of judges read this decision much too narrowly. They erroneously held that the *Gomery* decision hung solely on the fact that "adaptation of old carriers to handle concrete were shown to have been frequently made for several years before the application for the patent there in suit. The idea was already of common knowledge and was being applied generally. *Therefore,* Callahan's adaptation was not an invention."

This is entirely too narrow a reading of that decision,

which, as we understand it, lays down a much broader principle as to the prior art and development, as follows:

> "To say nothing of the universally known methods and appliances for raising and distributing water, there were ready at hand widely used and generally understood appliances for the *elevation and distribution* of *mobile substances,* such as *grain* and *coal,* which involved, both in principle and in practical detail, all the elements described in the Callahan claims. Failure to make use of these obviously applicable methods and appliances in combination, suitable to the particular work in hand, in dealing with a new, plastic material capable of similar treatment, would, we think, have evidenced a want of ordinary mechanical skill and of familiarity with construction problems and methods."

This principle laid down as to the obviousness of the application of devices for the elevation and distribution of mobile substances, such as grain, coal and water, requiring only mere mechanical skill, is based purely upon the *knowledge and perception* of the *common property or characteristic of mobility or fluency* possessed by *all* of these different substances. *The decision holds broadly that it is the existence and perception of this common property or characteristic that makes all of these devices analogous, and the adaptation or conversion of a device from one of these materials to another merely a double use.* The succeeding language referring to previous uses of conveying devices with liquid concrete was, as we read it, simply cited as corroborating this fundamental principle.

But, taking the *Concrete Appliances Co.* v. *Gomery* decision even of the narrow scope laid down by the

majority judges of the Second Circuit, they are still in error in not applying and following it. Taking the decision from their own erroneous basis, in the prior art before the Court were Smith patents 122,497 and 122,498, describing the preparation of liquid concrete, and method of blowing it, and disclosing the closed cylindrical chamber with the delivery pipe communicating from the bottom thereof and the compressed air pipe communicating into the top thereof. This was an "adaptation of old carriers to handle concrete," which according to the Second Circuit Court would bring the present case under the *Gomery* decision to invalidate the McMichael patent. Even reading the decision as of the scope erroneously contended by the majority judges here, it still would thus put upon them the duty of invalidating the McMichael patent on the prior patents hereinbefore described.

The second error of the majority judges in the Second Circuit rests in the next succeeding paragraph of the decision, which reads as follows:

> "But that is a very different situation from the one before us in the Ulen case, where *nobody before McMichael had ever used a pneumatic apparatus to transport concrete.* The Warren and Farnham sand-blast machines (patents No. 671,303 and No. 747,396) could not have been so used without increasing the size of the discharge pipes and cutting off the sand-blast nozzles. To do this was to make a new machine, and one who thought of doing it would have had a new and inventive idea; that is, that of *blowing concrete which had not been done before.* When that is so, the physical change in the apparatus need be very little to sustain a patent. The only reason why a new one is not patentable is that the law grants patents only for new things, not for new ideas. Similarly Goldie's

> machine (patent No. 707,840) for blowing cement could not, so far as appears, have been used as it stood for concrete, and never was so used. The Supreme Court case does not require us to reconsider the validity of McMichael's patent." (Italics our own.)

We confess that after the very careful presentation of proofs, the full discussion in the briefs, and the full presentation of argument on Smith patents 122,497 and 122,498 we were both amazed and disheartened to have the Court hold that: *"Nobody before McMichael had ever used a pnuematic apparatus to transport concrete."* Here is a flagrant error of fact, which is patent from a mere cursory examination of the face of the record, and we contend that we are entitled to a reversal on this one mistake of fact alone. There can be no sane questioning of the nature of the disclosure of the Smith patents 122,497 and 122,498. It is unnecessary to argue their clear disclosure of liquid concrete and the mechanism for "blowing" it.

The invalidating bearing of these Smith patents, *in* themselves and in view of the numerous other patents showing the introduction of compressed air at the bend of the delivery pipe has been fully discussed hereinbefore, and need not be repeated.

As to the theory in the preceding paragraph that a mere changing in the size of the pipes and nozzles of Farnham and Warren amounted to invention, the contrary is established by following extract from the specification of the McMichael patent (R.286 lines 107-122) as follows:

> "* * * The best results are attained by having the delivery pipe of a relatively large diameter so that there shall be freedom for these relative move-

> ments of the rock particles and of the sub-masses that are forcibly impelled ahead of the air jet. The delivery pipe itself becomes a mixing chamber wherein pneumatic mixing is effected or continued, and, if this duct is of a size properly related to the other parts, and to the sizes of the particles of the materials, the latter can be rapidly impelled through it without danger of clogging or choking. *The engineer, in any instance, will readily understand what the relative proportions of the parts should be;* * * *"*

This is a clear statement by the patentee himself that the proportioning of these pipes is a mere matter of mechanical skill, and would not be "a new and inventive idea" as stated by the majority judges.

In the next succeeding paragraph of their decision, the majority judges held as follows:

> "In the suit against Storrie & Co., Judge Bourquin seems to have relied to some extent, at least, upon patents which were not in the record in the Ulen case and are not now before us. *But whatever the court as now constituted might think of the correctness of our former ruling, it is our duty to follow it,* unless new evidence raises questions of the patent's validity not previously considered. See Cortelyou *v.* Charles E. Johnson & Co., 145 F. 933, 934 (C. C. A. 2); Crier *v.* Innes, 170 F. 324 (C. C. A. 2)."

The two Smith patents Nos. 122,497 and 122,498 were such "new evidence" raising questions of the patent's validity not previously considered, as required by the Court, and the evidence that the Court, in effect, absolutely ignored these patents is conclusive from the preceding paragraphs of the decision already discussed. The

Smith patents were not in evidence in the *Ulen* suit, nor were they cited by the Patent Office against the McMichael application. The C. C. A. Ninth Circuit stated there was uncontradicted evidence showing that the Smith patents are operative.

The next paragraph of this decision of the majority judges is most astonishing, and may we say with all due respect, most astonishingly illogical. This paragraph reads as follows:

> "The new evidence of the patent art upon which appellants rely to distinguish the Ulen decision includes two patents granted in 1872 to W. H. Smith. No. 122,497 is for an improvement in concrete pavements and claims concrete 'prepared for use in a liquid or semiliquid condition, capable of flowing in pipes and running into molds.' No. 122,498 discloses a machine for mixing liquid concrete and conveying it by a discharge pipe from the mixer to the spot where it is to be laid. The concrete is to flow through the discharge pipe by gravity, or, as an alternative, after flowing by gravity through a small winding passage into a chamber, F, is to be forced into the discharge pipe by the pressure of steam or compressed air admitted into the chamber above the mass of the concrete. The chamber has a flat bottom of large area relative to the size of the discharge pipe, the outlet of which opens into the center of the bottom. While this machine discloses the idea of forcing concrete through a pipe by compressed air, whether it was practically operable may well be doubted. It would seem that a large quantity of the concrete, or at least the stones of which it is partly composed, would necessarily accumulate upon the flat bottom of the chamber. In any event, it was very different from McMichael's device, which injects air into the concrete at its entrance into the discharge outlet. It cannot be regarded as an anticipation."

In the second preceding paragraph the majority judges stated "*nobody before* McMichael had ever used a pneumatic apparatus to transport concrete. * * * To do this was to make a new machine, and one who thought of doing it would have had a new inventive idea; that is, that of blowing concrete, *which had not been done before.*"

In the last quoted pargaraph, in speaking of the Smith patents, the majority opinion states:

> "No. 122,498 discloses *a machine for mixing liquid concrete and conveying it by a discharge pipe from the mixer to the spot where it is to be laid.* * * * after flowing by gravity into a chamber F, is *to be forced into the discharge pipe by the pressure* of steam or *compressed air admitted into the chamber above the mass of concrete.*"

These statements of fact in these successive paragraphs of the decision are absolutely contradictory of each other.

In practically throwing out the Smith patents, and ignoring their invalidating significance, the majority judges held "whether it was practically operable may well be doubted." There is no word of evidence to support this theoretical assumption upon which they erroneously dismissed consideration of the Smith patents.

Mr. Dyer, an eminent patent expert, regarded the Smith patents as operative, and so testified (R. 314).

The Smith patents in themselves give intrinsic evidence of having been practically worked out. In patent 122,497 (R.297, lines 30, *et seq.*), Smith states:

> "Such composition, however, I have discovered, *and have proved by a thorough course of experiments and trials,* its complete fitness for the purposes and the great practical utility of its application in the manner referred to."

As to Smith patent 122,498 the Court of Appeals for the Ninth Circuit in their unanimous decision, 27 Fed. (2) 838, stated:

> "Of the prior patents we find it necessary to refer particularly to but three, the patent to Smith, No. 122,498, of January 2, 1872, and the English patents to Duckham, one No. 4,400 of 1875, and one No. 15,348 of 1885. The Smith patent was for 'an improvement in the manufacture of concrete pavements and machinery for same.' The specifications described the apparatus as specially adapted to the manufacture and convection of concrete composition through pipes so as to set quickly upon reaching its destination and form a solid mass of artificial stone, **and uncontradicted testimony was given of the successful use of the Smith machine in conveying concrete through a pipe by compressed air.** The device *contained all the features of the appellant's patent except the nozzle for admission of air near the point of exit.*"

The Court of Appeals for the Second Circuit committed decisive error in brushing these Smith patents aside on a mere theoretical and unsupported assumption of inoperativeness, which is controverted by the facts above set forth.

That the prior art was not fairly and fully considered in *this* suit, over the *Ulen* suit, notwithstanding its differences, is frankly stated by the majority judges (27 Fed. [2] 671), as follows:

> "Apparently the 'slug' theory was brought into the argument because it was thought necessary to distinguish in this way from Farnham, Warren, and Goldie. We have already suggested that those machines would require modifications to operate with concrete containing stones an inch and a half

> in diameter. Whether this was the ground adopted to distinguish them in the Ulen Case, *or whether the court as then constituted accepted the slug theory, does not appear*, and is not important. *On some ground we distinguished the prior art, and sustained the validity of the patent, and that ruling we should follow, until its error is pointed out by higher authority.*"

We submit that the manifold errors of fact and law pointed out in the opinion of the majority judges in the Second Circuit, in themselves alone, entitle us to a reversal.

In the second paragraph under subdivisions (3, 4) of their decision, the majority judges throw out the "slug" theory of operation. This is a complete reversal of the finding of fact of the district judge, upon which he directly and solely based his judgment of infringement, namely, that both petitioner and respondent's machines or devices operate by the slug method.

On this point, the majority judges of the Court of Appeals, in the paragraph indicated held:

> "* * * *The patent says nothing which commits the patentee to the slug method of operation.* The theory is built upon the use of the phrase 'submasses,' as in lines 72 and 89, page 2, where it is said that the lower air jet 'engages with the submasses to push them along.' But this cannot mean solid 'slugs,' for *on the same page, lines 92-99, the effect is said to be thoroughly to commingle all the ingredients and insure a better mix.* Again, at line 113, page 3: 'The delivery pipe itself becomes a mixing chamber, wherein pneumatic mixing is effected or continued.' And see, also, line 86, page 3. **Such statements necessarily forbid the notion of solid slugs.**" (Italics ours.)

It is easy to realize the perplexity of the Court in considering together these two theories set up in the patent, namely, the sub-mass or "slug" theory and the theory that concurrently the unmixed ingredients of the concrete are mixed perfectly while flying through the pipe. They are assuredly irreconcilable and mutually exclusive, either from the standpoint of physical laws, or common-sense reasoning.

In all the litigation, however, there can be *no question whatsoever that the plaintiff-petitioner has based the McMichael patent fairly and solely on the solid slug theory.* Referring to the record in the *Ulen* suit, Exhibit D, page 49, folio 145, Kirkland, respondent's chief engineer, testified:

> "The air breaks up or penetrates the mass as it goes toward the outlet, detaching portions of it, *so that these portions will present a surface to the oncoming booster jet* so that they may be forced through the pipe."

Mr. Ray, plaintiff-respondent's expert in the *Ulen* suit, testified (Ulen Record, p. 127, fol. 381):

> "The pipe 10 which admits air to the bottom of the mass of concrete near the discharge of the receiver 1 builds up a pressure at that point and *cuts off, right at that point, a cylinder of concrete.*"
> * * * * * * *

(p. 128, fol. 383):

> "Now, as that *cylinder of concrete* passes out into the pipe, * * * and since *the cylinder of concrete* moves away rapidly * * *."
> * * * * * * *

(p. 129, fol. 386):

> "The net result of that is that it is possible to *handle this concrete in slugs* through a long pipe * * *."

There can be no question, in the face of this testimony of Mr. Kirkland, the chief engineer, and Mr. Ray, the expert employed by the respondent, that they base the novelty of their patent, and the question of infringement by others absolutely on the "slug" theory. Thus, the Court of Appeals departs entirely from the very basis of the record, and of the decision in the Court below, and still holds the patent to be infringed.

In the two suits here at bar, of the seven judges who have rendered opinions, at least six of them reject the "slug" theory of operation of plaintiff's device (Judge MANTON dissented without opinion). There can be no question that if the McMichael device does not operate on the slug principle, *it operates precisely as do all the devices of the prior art.* We are unable to understand, after abandoning the "slug" theory on what basis the majority judges in the Second Circuit Court of Appeals still differentiate the McMichael patent from the Beach, Warren and Farnham patents. It is true that the Court states in paragraph 1 of the decision that in order to use the devices of these patents to blow concrete, it would be necessary to increase the size of the discharge pipes and to cut off the inner end of the sand blast nozzle. *This is in effect holding that increasing the size of the pipes amounts to invention.* If that be sound law, then a second applicant for patent with a four inch pipe could secure a valid patent over a prior patentee showing a two inch pipe; and a third applicant with a four and one-half inch pipe could

secure a valid patent over both of the foregoing. On this point also the patent in suit states (R.286, lines 120-123) that proportion of parts is entirely within the skill of the engineer. We submit that considering the decision of the majority judges in the Second Circuit, they have no ground, after abandoning the "slug" theory, other than *that it requires invention to enlarge and reform the discharge pipe of the prior patents*, for holding the McMichael patent valid.

The Particular Claims in Suit.

We submit that the various grounds hereinbefore set forth for holding the McMichael patent totally invalid are so varied and strong, that great expenditure of time and thought on specific claims is neither warranted nor necessary. The specific claims involved in this suit are 2, 4, 6, 17, 21, 22, 28, 34 and 35.

Each of these claims is limited to the method of, or mechanism for, mixing the *"concrete forming" materials* by the blasts of compressed air while the charge of materials is being blown through the delivery or discharge pipe. EACH of these claims has in its preamble the phrase "a chamber for containing *concrete forming materials*" or its equivalent. That expression does not describe concrete, but *does* describe sand, stones, cement and water *before they have become concrete*. Each claim then specifies the method of, or means for, blowing these *concrete forming materials* through the delivery or discharge pipe to mix them together *to make concrete* (R.286 lines 69-94). Each of these claims and the specification as referred to dovetail exactly to cover the concrete *mixing* process.

Therefore, every one of the claims is based on the new matter illegally introduced into the application in 1911.

If the claims are read otherwise, and the device be regarded merely as a blower of granular and plastic materials, then they read directly on the prior patents and are invalidated thereby.

In addition, nearly all of the claims specify, in more or less definite language, two compressed air pipes, both discharging into the mass of *concrete forming materials within the chamber*, for example: R. 287 lines 103-7, lines 124-6; R. 288 lines 14-17; R. 289, lines 19-22. Thus, this feature also is based on the new matter. If they be limited to the precise location of the air pipe 10, they are not possibly infringed. If not so limited, they are invalid for new matter, and (irrespective of the reference to the unmixed ingredients) are also invalidated by reading directly on the prior patents which show a second air pipe discharging into the bend of the delivery pipe. This feature is shown in *nearly all the patents in the prior art.* Petitioners adopted it from these *expired* patents.

It is submitted that the claims considered individually are all invalid for the reasons stated.

If the mechanism claims be read to give effect to their *actual* words and import, *i. e.*, "a chamber for containing *concrete forming* materials," they are in actuality *nothing more than disguised method or process claims* for the new method of mixing the concrete forming materials while being blown through the delivery pipe, *which was illegally introduced into the application as new matter in 1911.*

Claims must be read to *give effect to all their terms, in the light of the specification.*

In *Singer Co.* v. *Cramer*, 192 U. S. 265; 24 S. Ct. Rep. 291, 299, this Court held:

> "To prevent a broadening of the scope of the invention beyond its fair import, in the light of the

circumstances surrounding the issuance of the patent, the words of limitation contained in the claim must be given due effect, and giving them such effect, the statement in the first claim of the elements entering into the combination must be construed to refer to elements in combination having substantiaily the form and constructed substantially as described in the specification and shown in the drawing."

In *Motion Picture Co.* v. *Universal Film Co.*, 243 U. S. 502, 37 S. Ct. 416, 418, this Court held:

"1st. *The scope of every patent is limited to the invention described in the claims contained in it, read in the light of the specification.* These so mark where the progress claimed by the patent begins and where it ends that they have been aptly likened to the description in a deed, which sets the bounds to the grant which it contains. It is to the claims of every patent, therefore, that we must turn when we are seeking to determine what the invention is, the exclusive use of which is given to the inventor by the grant provided by the statute,—*'He can claim nothing beyond them.' Keystone Bridge Co.* v. *Phoenix Iron Co.*, 95 U. S. 274, 24 L. ed. 344; *Lehigh Valley R. Co.* v. *Mellon*, 104 U. S. 112, 118, 26 L. ed. 639, 641; *Yale Lock Mfg. Co.* v. *Greenleaf*, 117 U. S. 554, 559, 29 L. ed. 952, 953, 6 Sup. Ct. Rep. 846; *McClain* v. *Ortmayer*, 141 U. S. 419, 424, 35 L. ed. 800, 802, 12 Sup. Ct. Rep. 76."

In *White* v. *Dunbar*, 119 U. S. 47, 7 S. Ct. Rep. 72, 74, this Court held:

"We see nothing in all this to raise the slightest implication that the patentees were the inventors of the process of interposing any and every kind of lining between the cans and their contents, and, when their claim is confined to a lining of textile

fabric, it is tantamount to a declaration that they claimed nothing else. *Some persons seem to suppose that a claim in a patent is like a nose of wax, which may be turned and twisted in any direction, by merely referring to the specification, so as to make it include something more than, or something different from, what its words express.* The context may, undoubtedly, be resorted to, and often is resorted to, for the purpose of better understanding the meaning of the claim; but not for the purpose of changing it, and making it different from what it is. The claim is a statutory requirement, prescribed for the very purpose of making the patentee define precisely what his invention is; *and it is unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms.* This has been so often expressed in the opinions of this court that it is unnecessary to pursue the subject further. See *Keystone Bridge Co.* v. *Phoenix Iron Co.*, 95 U. S. 274, 278; *James* v. *Campbell*, 104 U. S. 356, 370."

Authorities.

All the prior patents are in the general art of blowing granular and plastic materials and are invalidating. In the light of these cases, *this would be so, even if the Smith patents did not disclose the "blowing" of concrete.*

> *Atlantic Works* v. *Brady*, 107 U. S. 192; and
> *Hollister* v. *Benedict*, 113 U. S. 59, quoted and followed in *Concrete Appliance Co.* v. *Gomery*, 269 U. S. 177.

In *Lovell Manufacturing Co.* v. *Carey*, 147 U. S. 623, it was held:

> "* * * But it does not amount to invention to discover that an old process is better in its results,

when applied to a new working, than would have been expected; the difference between its prior working and the new working being only one of degree, and not one of kind. It has been often held that the mere fact that one who uses a patented process finds it applicable to more extended use than has been perceived by the patentee is not a defense to a charge of infringement. *It follows necessarily that the public cannot be deprived of an old process because some one has discovered that it is capable of producing a better result, or has a wider range of use than was before known.*

"In *Smith* v. *Nichols*, 21 Wall. 112, it was held that a mere carrying forward, *or new or more extended application, of the original thought; a change only in form, proportions, or degree;* the substitution of equivalents; doing substantially the same thing in the same way, by substantially the same means, with better results,- -was not such invention as would sustain a patent; and in *Roberts* v. *Ryer*, 91 U. S. 150, it was held that it *was no new invention to use an old machine for a new purpose*, and that the inventor of a machine was entitled to the benefit of all the uses to which it could be put, no matter whether he had conceived the idea of the use or not.

* * * * * * *

"The principle deducible from those cases is that it *is not a patentable invention to apply old and well-known devices and processes to new uses in other and analogous arts.* The decision in Ansonia Brass & Copper Co. *v.* Electrical Supply Co., *supra*, is very pertinent. In the opinion in that case the cases were reviewed which established (1) that the application of an old process or machine to a similar or analogous subject, with no change in the manner of application, and no result substantially distinct in its nature, will not sustain a patent, *even if the new form of result had not before been contemplated;* * * *"

In *Dreyfus* v. *Searle*, 124 U. S. 60, it was held:

"'* * * There was no patentable invention in applying to the heating of wine or any other liquor, from the inside of the cask, the apparatus which had been previously used *to heat another liquid in the same manner*. The case falls directly within the decisions of this court in *Pomace-Holder Co.* v. *Ferguson*, 119 U. S. 335, 338, 7 Sup. Ct. Rep. 382, and the cases there collected, and in *Heating Co.* v. *Burtis*, 121 U. S. 286, 7 Sup. Ct. Rep. 1034."

In *Morris* v. *McMillin*, 112 U. S. 244, it was held:

"The following cases illustrate the grounds upon which we base this conclusion: It was said by Mr. Justice Bradley, in delivering the judgment of this court in *Atlantic Works* v. *Brady*, 107 U. S. 192, S. C. 2 Sup. Ct. Rep. 225: 'The process of development in manufactures creates a constant demand for new appliances which the skill of ordinary head-workmen and engineers is generally adequate to devise, and which, indeed, are the natural and proper outgrowth of such development. Each step forward prepares the way for the next, and each is usually taken by spontaneous trials and attempts in a hundred different directions. To grant to a single party a monopoly of every slight advance made, except where the exercise of invention somewhat above ordinary mechanical or engineering skill is distinctly shown, is unjust in principle and injurious in its consequences.' In the case of *Pennsylvania R. Co.* v. *Locomotive Truck Works*, 110 U. S. 490, S. C. 4 Sup. Ct. Rep. 220, Mr. Justice Gray, speaking for the court, declared it to be the result of the decisions of the court that 'the application of an old process or machine to a similar or analogous subject, with no change in the manner of application and no result substantially distinct in its nature, will not sustain a patent, even if the new

> form of result has not been before contemplated.' In *Hailes* v. *Van Wormer*, 20 Wall. 353, where the patentee had taken a fire-pot from one stove, a flue from another, and a coal reservoir from the third, and had put them into a new stove, where each fulfilled the office it had fulfilled in its old situation, and nothing more, the patent was held void for want of invention. * * *'"

In *Grinnell Co.* v. *Johnson Co.*, 247 U. S. 426, it was held:

> "In *Specialty Manufacturing Company* v. *Fenton Metallic Manufacturing Co.*, 174 U. S. 492, 498, 19 Sup. Ct. 641, 643 (43 L. Ed. 1058), the rule was again tersely stated:
>
> "'Where a combination of old devices produces a new result such combination is doubtless patentable, but where the combination is not only of old elements, *but of old results, and no new function is evolved from such combination*, it falls within the ruling of this court in *Hailes* v. *Van Wormer*, 20 Wall. 353, 368 (22 L. Ed. 241); *Reckendorfer* v. *Faber*, 92 U. S. 347, 356 (23 L. Ed. 719); *Phillips* v. *Detroit*, 111 U. S. 604 (4 Sup. Ct. 580, 28 L. Ed. 532); *Brinkerhoff* v. *Aloe*, 146 U. S. 515, 517 (13 Sup. Ct. 221, 36 L. Ed. 1068); *Palmer* v. *Corning*, 156 U. S. 342, 345 (15 Sup. Ct. 381, 39 L. Ed. 445); *Richards* v. *Chase Elevator Co.*, 158 U. S. 299 (15 Sup. Ct. 831, 39 L. Ed. 991).'"

As to changes in sizes of pipes:

In *Clark Pomace Co.* v. *Ferguson*, 119 U. S. 335, it was held:

> "The only point of the invention would seem to be the use of a guide-frame smaller than the rack, or, in other words, the use of a rack larger than the guide-frame. *There was no invention in making the guide-frame or the rack of the desired size.*"

As to invalidation by introduction of new matter:

In *Lopulco Systems* v. *Bonnot Co.*, 24 Fed. (2) 510, the patent was held to be invalid for new matter exactly as in the case at bar (citing *Railway* v. *Sayles*, 97 U. S. 563; *Corbin Co.* v. *Eagle Co.*, 150 U. S. 43).

In *General Electric Co.* v. *Sangamo Co.*, 174 Fed. 251, it was held:

> "* * * A reading of Cox's original application discloses either that Cox did not discern that there was a deficiency in existing meters other than that produced by the variation of the plate by temperature, he did not know the means of overcoming them; or (and this probably is the fact), discerning that the disk was varied by causes other than temperature, and knowing the means of overcoming them, he did not regard either the discernment of the deficiency or the perception of the means as something that was new; for, had he regarded such discernment of the deficiency, and such perception of means, as something new, he would have embodied them in his application and original claims.
> * * * * * * *
> * * * and, *of course, such conception after the reading of Lanphier's application would be anticipated by the Lanphier disclosures;* so that there is nothing in the record before us showing that Cox anticipated Lanphier in either one of the two acts constituting invention, so far as either of those acts relate to the variation of the disc produced by causes other than temperature. *The claim of the Cox patent to this extent, therefore, are invalid.*"

As to introduction of new matter:

In *Michigan Central R. Co.* v. *Consolidated Car-Heating Co.*, 67 Fed. 121, the Court of Appeals for the Sixth Circuit (JJ. TAFT, LURTON and SEVERENS) held:

"The leading case upon this subject is that of *Railway Co.* v. *Sayles*, 97 U. S. 554.

* * * * * * *

And it was said by Mr. Justice Bradley, delivering the opinion of the court, that, if the amended application and model embodied any material addition to or variance from the original,—anything that was not comprised in that,—such addition or variance could not be sustained on the original application:

" 'The law does not permit such enlargements of an original specification, which would interfere with other inventors who have entered the field in the meantime, any more than it does in the case of reissues of patents previously granted. Courts should regard with jealousy and disfavor any attempts to enlarge the scope of an application once filed, or of a patent once granted, the effect of which would be to enable the patentee to appropriate other inventions made prior to such alteration, or to appropriate that which has in the meantime gone into public use.'

"In that case five years elapsed after the application was filed before the amendment was made. In this case a much less period intervened, but the length of time is not a controlling consideration, as is shown in the cases hereafter to be referred to.

"It will be seen from the opinion in *Railway Co.* v *Sayles* that the objection to new matter brought in by amendment of the specifications stands upon the same ground as when it is introduced upon a reissue, and in respect to the latter the statute declares that it shall not be done. Rev. St., par. 4916."

It is submitted that the McMichael patent is entirely invalid (1) in view of the prior art considered alone; (2)

in view of the prior art in the light of the *Concrete Appliance Co.* v. *Gomery* decision of this Court; (3) by reason of the introduction of new matter into the application in 1911; (4) in view of prior uses proved in this case; and (5) in view of prior uses proved in the companion case No. 528.

It is respectfully prayed, therefore, that the bill be dismissed with costs to the defendants.

Respectfully submitted,

JOHN D. MORGAN,
ALAN M. JOHNSON,
Counsel for Petitioners.

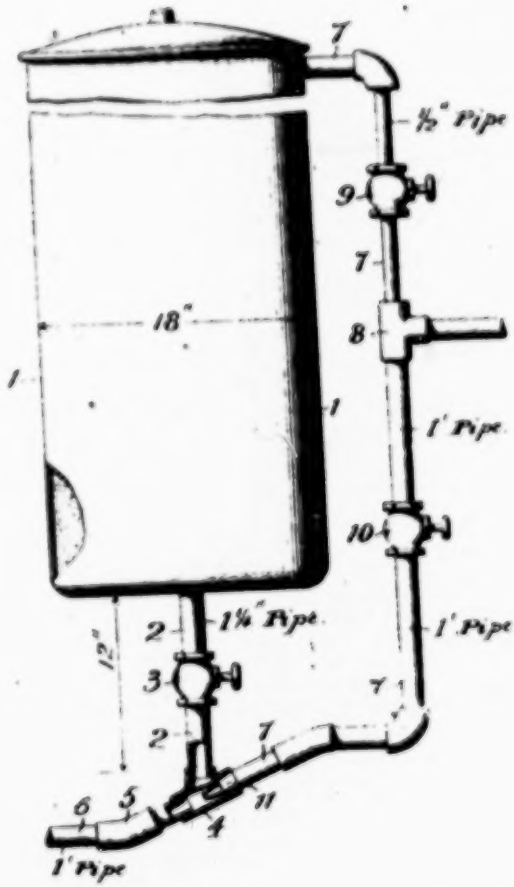
No. 747,396. PATENTED DEC. 22, 1903.

H. FARNHAM.

SAND BLAST APPARATUS.

APPLICATION FILED APR. 10, 1903.

NO MODEL.



WITNESSES

Jas. E. Hutchinson.

H. C. Parker.

INVENTOR

Henl Farnham

by H. C. Parker, Atty.

No. 747,396. Patented December 22, 1903.

UNITED STATES PATENT OFFICE.

NEAL FARNHAM, OF CHICAGO, ILLINOIS.

SAND-BLAST APPARATU.

SPECIFICATION forming part of Letters Patent No. 747,396, dated December 22, 1903.

Application filed April 10, 1903. Serial No. 151,998. (No model.)

To all whom it may concern:

Be it known that I, NEAL FARNHAM, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sand-Blast Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the figures of reference marked thereon, which forms a part of this specification.

My invention relates to a sand-blast apparatus; and it has for its object to produce such an apparatus in which the sand will pass from the reservoir or tank by gravity alone or by gravity aided by compressed air within the reservoir under regulation, the sand passing from the tank through a delivery-pipe leading to a blast-pipe provided with a blast nozzle or jet whose point of discharge is substantially beneath the discharge of the delivery-pipe into the blast-pipe, so as to prevent any backflow of air from the sand-carrying pipe or hose into the delivery-pipe and at the same time permitting the air-blast from the blast-nozzle to impact against the sand as it flows from the discharge-pipe, so as to drive it through the sand-carrying hose to the point of its application.

It has, further, for its purpose to provide a coupling between the vertical discharge-pipe leading from the sand-tank, the sand-carrying hose, and the air-blast-supply pipe, arranged so that the coupling will stand at an oblique angle to the longitudinal axis of the discharge-pipe, whereby the air-blast will be projected at an oblique angle across the discharge-mouth of the vertical discharge-pipe, the purpose of the first and second stated objects being to facilitate the freer passage of the sand from the tank through the discharge and into the sand-carrying hose and without clogging of the sand at either end of the discharge-pipe, which otherwise would be liable to occur by reason of back pressure of air in the discharge-pipe and condensation of moisture in the air-blast.

To the accomplishment of the foregoing and such other objects as may hereinafter appear the invention consists in the construction and in the arrangement of parts hereinafter particularly described and then sought to be clearly defined by the claims, reference being had to the accompanying drawing, forming a part hereof, and in which the figure is a side elevation of a sand-tank having my invention applied, a portion of the upper part of the tank being broken away.

In the drawing the numeral 1 designates a tank of any suitable configuration and dimensions designed to hold the sand. From the bottom of the tank leads a discharge-pipe 2, provided with suitable valves or valve 3 to regulate the flow of sand through the pipe. To the lower end of the discharge-pipe is attached a Y-coupling 4, which is inclined to the pipe 2 and, as shown, stands obliquely or at an angle of about forty-five degrees, more or less, to the longitudinal axis of the discharge-pipe. To one end of this coupling is attached, by a nipple 5 or otherwise, a sand-carrying hose 6 of any desired length to lead to the point of application of the sand-blast, which hose may be of pliable material or of rigid material provided with any desired number of flexible joints 6. To the other end of the coupling is connected an air-blast pipe 7, to which compressed air is supplied through a T or other coupling 8 from a suitable source of supply. The other end of the pipe 7 opens into the upper part of the tank 1, and said pipe is provided with a valve 9, by which the supply of air to the tank may be regulated or entirely cut off, and it is also provided with a valve 10, by which the supply of compressed air to the blast-nozzle may be controlled. At the point where the air-blast pipe 7 connects with the inclined coupling 4 it is provided with a nozzle or jet 11, which enters the coupling, so that its point of discharge will lie below the discharge-mouth of the discharge-pipe 2, leading from the tank, the best results being obtained when its point of discharge is about midway of the discharge-mouth of the discharge-pipe. By thus positioning the air-blast nozzle the air is projected across the mouth of the discharge-pipe 2 without the blast passing up into the discharge-pipe and at the same time creates a suction across the discharge-pipe and down through the same, so that the downflow of the sand through the

pipe is greatly facilitated. At the same time the force of the air-blast from the nozzle across the mouth of the discharge-pipe strikes the sand as it issues from the mouth of the pipe and propels it with velocity away from the pipe and through the carrying-hose and prevents any backflow or back pressure from the hose or coupling and into the discharge-pipe. If this back pressure were permitted, it would not only retard the downflow of the sand, but it would also result in the sand becoming moist from condensation of the compressed air, and thus the pipe would become clogged and the efficient working of the device interfered with. The inclination of the coupling at the lower end of the discharge-pipe also aids in the rapid flow of the sand from the mouth of the discharge-pipe, so as to aid in preventing backflow or back pressure of air.

By adjustment of the valve 9 more or less pressure of air may be admitted to the tank to assist the outflow of sand therefrom and its outflow regulated to a nicety, or the air may be entirely cut off from the tank.

The tank may be supported from the ground upon any suitable stand or otherwise supported.

I have indicated on the drawing the preferred dimensions of the parts; but they may be varied within reasonable limits.

Having described my invention and set forth its merits, what I claim is—

1. A sand-blast apparatus comprising the tank, the discharge-pipe leading from it, the compressed-air-supply pipe, sand-carrying hose, and the air-blast nozzle having its point of discharge beneath the mouth of the discharge-pipe leading from the tank, substantially as described.

2. A sand-blast apparatus comprising the tank, the discharge-pipe leading from it, the inclined coupling at the lower end of the discharge-pipe, the compressed-air-supply pipe, the sand-carrying hose, and the air-blast nozzle entering the inclined coupling and having its point of discharge beneath the mouth of the discharge-pipe leading from the tank, substantially as described.

3. A sand-blast apparatus comprising the tank, the discharge-pipe leading from it, the sand-carrying hose, the compressed-air-supply pipe opening into the upper part of the tank and having the upper and lower controlling-valves, the inclined coupling between the sand-carrying hose, the compressed-air-supply pipe and the discharge-pipe from the tank, and the air-blast nozzle having its point of discharge in the inclined coupling beneath the mouth of the discharge-pipe from the tank, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

NEAL FARNHAM.

Witnesses:
W. G. HENDERSON,
GEO. W. [illegible].

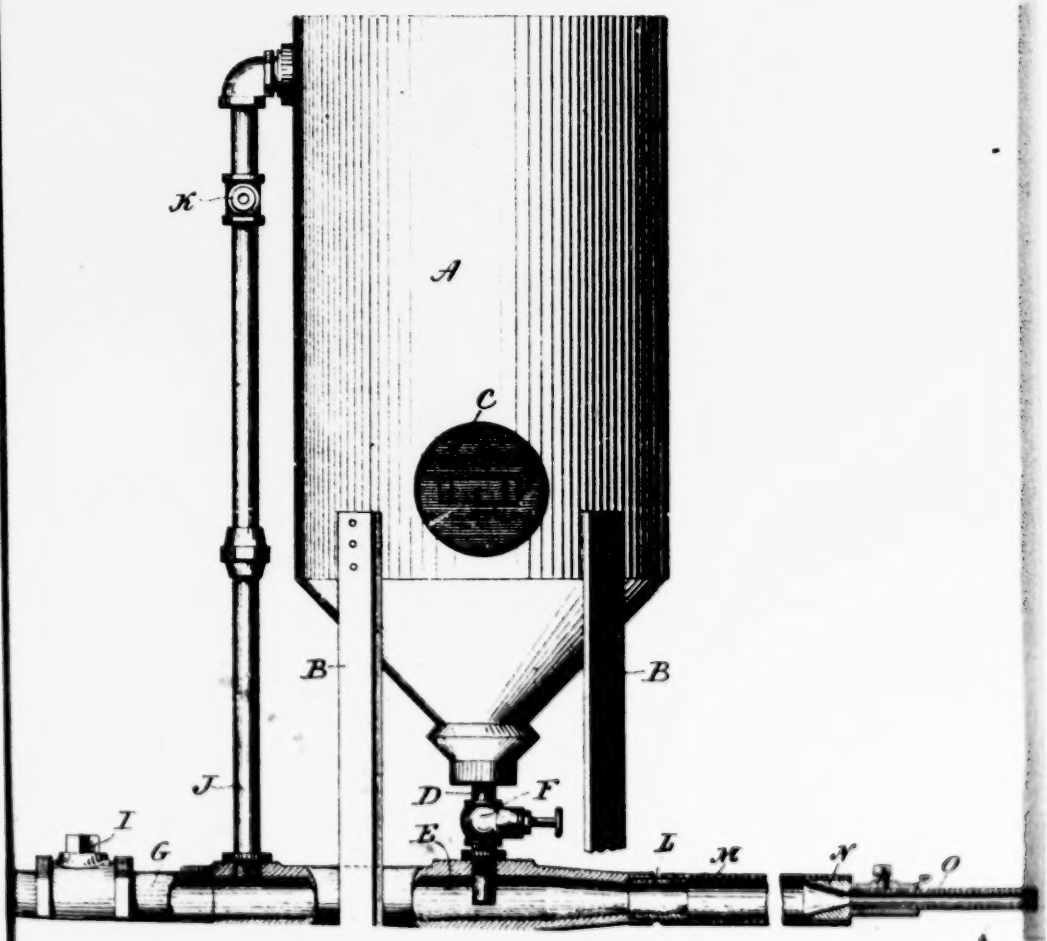
No. 671,303. Patented Apr. 2, 1901.

A. G. WARREN.

MIXER FOR SAND BLAST APPARATUS.

(Application filed May 26, 1900.)

(No Model.)



UNITED STATES PATENT OFFICE.

AMBROSE G. WARREN, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO J. W. PAXSON COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

MIXER FOR SAND-BLAST APPARATUS.

SPECIFICATION forming part of Letters Patent No. 671,303, dated April 2, 1901.

Application filed May 26, 1900. Serial No. 18,040. (No model.)

To all whom it may concern:

Be it known that I, AMBROSE G. WARREN, of Holyoke, in the county of Hampden and State of Massachusetts, have invented a new Improvement in Mixers for Sand-Blast Apparatus; and I do hereby declare the following, when taken in connection with the accompanying drawing and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification, and represents a side view, partially in section, of a mixer for sand-blast apparatus constructed in accordance with my invention.

This invention relates to an improvement in mixers for sand-blast apparatus, and particularly for the device for mixing the sand with air and conducting it to the point where it is to be discharged, the object of the invention being a simple arrangement of mechanism whereby the sand from the reservoir or hopper may be discharged into the blast of air; and it consists in the construction as hereinafter described, and particularly recited in the claim.

As herein shown, the device consists of a reservoir or hopper A, preferably cylindrical, with a tapered or conical lower end and substantially air-tight. This reservoir is supported with its conical end downward by suitable legs or braces B. In one side is a hand-hole which is adapted to be tightly closed by a cap C in any suitable manner, and, if desired, a similar hand or filling hole may be formed in the top of the hopper. Coupled with the lower end of the hopper is a discharge-pipe D, which opens into a cylindrical chamber E and extends downward therein to a point preferably just below the horizontal center. In this pipe D is a valve F, of any preferred form, which is adapted to open or close the discharge through the pipe. The chamber E is adapted at one end to be coupled with a pipe G from the receiver or source of supply. Preferably this chamber will also be formed with a foot or base H, which will assist in supporting it. In the supply-pipe G is a valve I, of ordinary construction, and adjacent to the valve is an outlet into a pipe J for the passage of air into the top of the hopper, and preferably this pipe will be provided with a cut-off valve K. At the opposite end the mixing-chamber is reduced in diameter and is internally threaded for connection with a coupling-sleeve L, over which a flexible hose or tube M may be passed. This tube is of any desired length, and in its opposite end a nipple N is inserted, the opening through the nipple contracted, and its outer end adapted to receive a discharge-nozzle O.

The operation of the device is as follows: Air is admitted through the pipe G into the chamber E, and the valve F being open permits sand to pass from the hopper through the pipe D into the chamber and into the blast of air, with which it mingles and by which it is carried through the chamber into the flexible tube M and discharged through the nozzle O. If necessary to maintain a proper pressure and so as to cause the sand to feed, the valve K may be opened to permit a portion of the air to enter the top of the hopper and so as to force it through the discharge-opening at the bottom.

It is evident that instead of having the pipe J open out of the chamber it may lead from the receiver direct or from any part of the conducting-pipe to the mixing-chamber.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a mixer for sand-blast apparatus, the combination of a hopper contracted at its lower end, a mixing-chamber below said hopper, a pipe opening from the lower end of the hopper and extending into said chamber to a point below the longitudinal center thereof, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

AMBROSE G. WARREN.

Witnesses:
EUGENE W. KING,
CHARLES C. FORD.

No. 707,840. Patented Aug. 26, 1902.

W. GOLDIE.

METHOD OF BALLASTING RAILWAY TRACKS.

Application filed Jan. 10, 1902.

Fig. 1

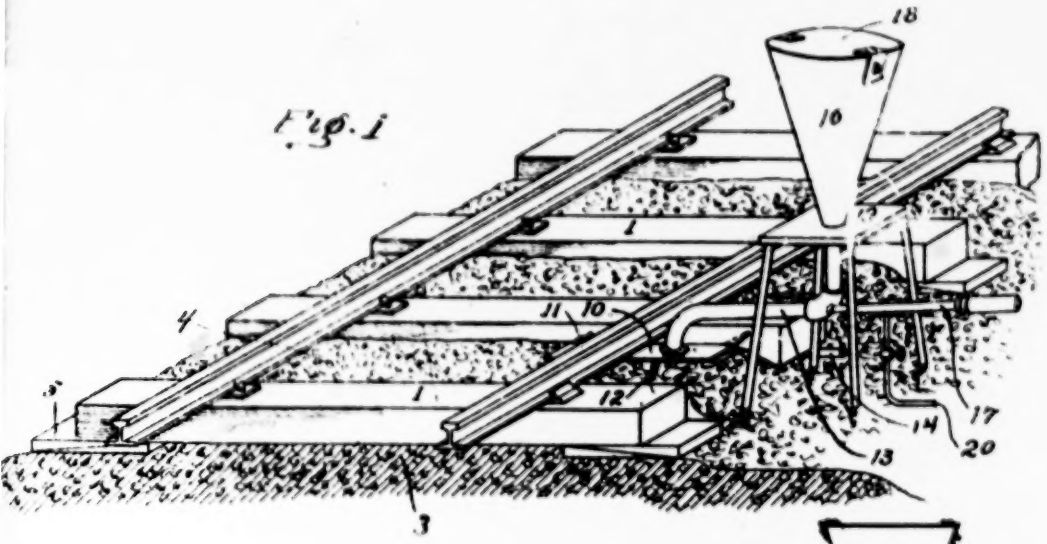


Fig. 2

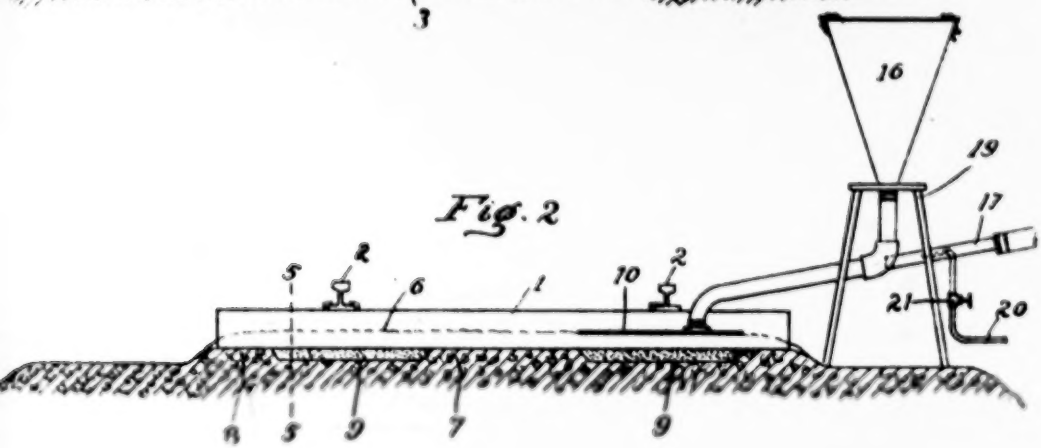


Fig. 3

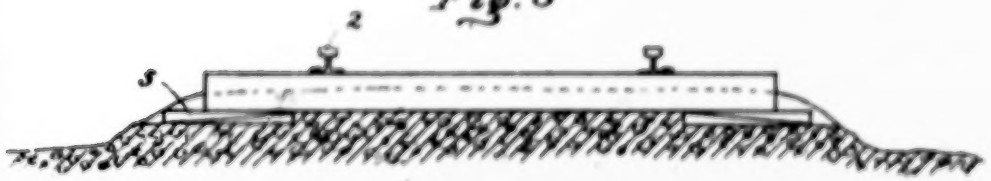


Fig. 4

Witnesses.
Fred C. Lucas.

Inventor.
William Goldie
By Kay & Totten
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM GOLDIE, OF WILKINSBURG, PENNSYLVANIA.

METHOD OF BALLASTING RAILWAY-TRACKS.

SPECIFICATION forming part of Letters Patent No. 707,840, dated August 26, 1902.

Application filed January 10, 1902. Serial No. 88,147. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM GOLDIE, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Methods of Ballasting Railway-Tracks; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the surfacing of railroad-tracks; and its object is to provide a method for bringing the tracks to and holding them at a proper surface without the necessity of tamping, which is the main means now employed on the ordinary steam-railroads for such purposes.

In a patent granted to me June 11, 1901, No. 676,128, is described at length the method of constructing and ballasting ordinary steam-railroad tracks and the causes which make it necessary to surface said tracks, all of which need not be repeated here. Suffice it to say that the ordinary way of surfacing a track consists in raising the deflected ties slightly by means of jacks and then packing or tamping the ballast under them by means of shovels or tamping-tools. As stated in said patent, this method of surfacing tracks is objectionable, because it is liable to disturb the solid bed of ballast under the tie formed by the weight of the trains, and after the surfacing has been accomplished in this manner the track necessarily rests on a fresh portion of gravel or stone, which is liable again to pack and sink under the weight of the trains, so that repeated surfacing of the track is necessary to maintain it in good condition. In said patent is also described and claimed a method of surfacing railroad-tracks whereby these objections are overcome, said method consisting, briefly stated, in injecting under the ties and upon the permanent solid bed formed thereunder cement in a plastic state, by the setting or hardening of which a solid support for the tie is formed. In carrying out this method in order to inject the plastic cement under the ties it is necessary that the latter be of such a consistency that it will flow readily, and by reason of the fluidity thereof it may happen that a train passing over the track before this plastic mass has set or hardened will force the same from under the tie, thereby leaving the latter without a proper support.

It is the object of the present invention to overcome this possible defect in the method described in my patent aforesaid, and the said invention is an improvement upon said method; and it consists, generally stated, in injecting the cement or similar material under the tie in a practically dry state and simultaneously imparting thereto sufficient moisture to insure the setting of the cement, but not sufficient to render the same plastic or fluid, so that after having been packed solidly under the tie it cannot become displaced by a passing train, but will remain in that position and set or harden by reason of the moisture imparted thereto.

The invention also includes certain other improvements, such as raising the track, supporting alternate ties while injecting the cement under the unsupported ones, and then subsequently treating the supported ties, placing dam-plates at the sides of the ties to confine the cement, and, if necessary, tamping at the sides of the ties near the end before injecting the cement in order to confine the flow of the latter, moistening the cement by means of a spray of atomized water, and other improvements which will hereinafter be particularly set forth and claimed.

In the accompanying drawings, Figure 1 is a perspective view of a track, illustrating the method of surfacing the same. Fig. 2 is a side view of the necessary apparatus and a cross-sectional view of the track. Fig. 3 is a cross-section of the track, illustrating means for supporting the ties; and Fig. 4 is a longitudinal section of the track on the line 5 5, Fig. 2.

In carrying out the invention I may employ any suitable quick-setting cement, such as Portland cement or cement of like character, the purpose being to provide solid interposed beds between the ties and the ballast-beds on which the ties have been seated, which will conform substantially to both the ballast-bed and the lower surface of the tie. The cement may be and preferably is mixed with sand or similar material, and the term "cement" as used in the specification and claims is therefore to be understood as including not only such cement when used alone, but also when used with sand, lime, or even fine gravel or other material. This cement is to be injected either mechanically or under fluid-pressure, preferably the latter, under the ties and substantially in a dry state,

being, however, slightly moistened either simultaneously or before or after it is inserted, so that it will set quickly to form a solid bed, but not sufficiently to render it so plastic or mobile that it can be forced from under the ties by the weight of a passing train before it has become set. By "injecting the cement under the tie" I mean forcing the same thereunder by means of a constant or uniform pressure, such as compressed air or steam or even mechanical means, to cause a stream of the material to flow under the tie without disturbing the underlying compacted bed of ballast and without the necessity of tamping, which latter is to be avoided, since it disturbs said solid bed of ballast previously formed under the tie.

For the practice of my invention I may employ any suitable apparatus, the drawings showing very simple apparatus suitable for the purpose; but it will be understood that the invention is not limited in this particular.

The invention is illustrated as forming cement bodies or beds near the ends of the ties underneath the rails, leaving the central portion of the ties supported merely upon the ballast, so as to prevent center binding.

The ties 1 shown are the ordinary wooden ones, although the invention may be employed with metallic ties, if desired or necessary. The rails 2 are generally located from fifteen to eighteen inches from the ends of the ties, and the purpose of the invention is to form a cement support under the rails, so as to give a direct support thereto. The ties rest upon the usual ballast-bed 3, and the ballast is filled in between the tracks, as at 4, which ballast extends up toward or to the tops of the ties. Any suitable mechanical support for bringing the track to the desired level at different points may be employed, such as the shims or wedges 5, which may be placed under the ends of the ties, as shown in Figs. 1 and 3, or may be placed between the ties and the rails, as shown and described in the patent above referred to. These shims are simply two tapering pieces of wood, one being inserted under the tie and the other being driven between it and the tie or the ballast-bed, thereby raising the tie and giving a sufficiently-strong support to sustain the track while the cement beds are being formed under the ties. In place of these shims ordinary lifting-jacks or other means may be employed, and said jacks may of course be used to raise the track to permit the placing of the shims 5 thereunder. These shims or other means are inserted under the ends of any suitable number of ties to give the temporary support to the track, and the cement beds are then formed under the other ties. The ballast 4 between the ties forms side walls to confine the space under each tie, and thereby confine the flow of the cement; but if this is not sufficient the operator will, after the tie has been raised and supported on the shims, tamp the ballast in at the sides of the tie near the end thereof, as at 6, and also on the inside of the rail, as at 7, and will also tamp the same under the outer end of the tie, as at 8, thereby leaving a space or chamber 9 underneath the tie under the rail, which space is to be filled with the cement. The tamping in of the ballast at the points 6, 7, and 8 will to a great extent confine the flow of the cement. The workman will then place at the side of the tie at the surface of the ballast 4, underneath the rail, the dam-plate 10, thereby forming a dam to prevent the cement from flowing backwardly from under the tie. This dam-plate is simply a metal plate of the proper width and length and is provided with a sharpened edge or, better still, with prongs 11, which is or are driven into the side of the tie to hold the plate in place. The dam-plate is also provided with a nippled opening 12, to which is secured the outer end of a hose or pipe 13, leading from the injecting apparatus. If necessary or desired, a similar dam-plate, but without the nippled opening 12, may be placed on the opposite side of the tie to prevent the cement from being forced out at said opposite side. It is also desirable to insert under the end of the tie and into the chamber 9 a drainage mold-bar 14, which is merely a long bar inserted under the tie for a greater distance than the cement bed is to be formed, so as to insure the formation of a drainage-canal 15 for conducting away any water that may collect under the middle of the tie, thereby preventing rotting of the latter.

The apparatus illustrated in the drawings for injecting the cement consists of the injector pipe or hose 13, connected to the nippled opening of the plate 10 or otherwise suitably projecting into the chamber or space 9 under the tie, a funnel or other suitable vessel 16 communicating with said pipe or hose, and a suitable source of fluid-pressure, such as the steam-pipe 17. The funnel 16 is provided with a cover 18, whereby it may be securely closed, and it may be supported upon any suitable platform, truck, car, or other support, the drawings merely showing a stand 19 for this purpose, which stand, however, is merely diagrammatic. The fluid-pressure for forcing the material under the tie may be either air or steam; but as the latter is the easier to generate I prefer to use the same. The injector pipe or hose 13 has a bend or elbow 21 just below the funnel 16, and the steam-pipe 17 projects into the injector pipe or hose 13 at this bend and has its end lying below the opening from the funnel 16, so that the steam will act on the principle of an ordinary injector and draw the cement out of the funnel 16 and force it through the hose or pipe 13 down underneath the tie. Any suitable means may be used for slightly moistening the said cement as it is forced under the tie; but I prefer to introduce a small water-pipe 20 into the steam-pipe, as shown, so that the flow of the steam or other fluid-

pressure will draw a fine stream of water into the pipe 17 and at the same time atomize it and thoroughly mingle it with the cement as the latter is forced by the fluid-pressure under the tie.

In carrying out the method the cement or the mixed cement and sand or gravel are placed in a dry state in the funnel 16. The cover 18 is closed down, and after the apparatus has been properly connected to the dam-plate 10 fluid-pressure, such as steam, is admitted through the pipe 17, the valve 21 in the water-pipe being opened. The flow of the steam or other pressure draws a stream of water through the pipe 20, atomizes the same, forces the same out at the end of the steam-pipe 17, and simultaneously draws the dry cement and other material down out of the funnel 16, mixing it with the atomized water and forcing the mixed mass through the pipe 13 into the space or chamber 9 underneath the tie. The cement is thus injected in a slightly-moistened condition between the tie and the solid ballast-bed 3, spreading out under the same and being confined by the dam-plates and the walls or sides of the ballast 4 between the ties, thereby completely filling such space and conforming to the ballast-bed 3 and the bottom and sides of the tie, so forming a solid interposed bed underneath the tie which gives support to the tie for its full width and conforms substantially to the under face of the tie and to the top face of the ballast. The fluid-pressure is maintained until the entire space under the tie is filled with a solid mass of very slightly moistened cement, which mass is not sufficiently fluid to be displaced by a passing train, but which contains sufficient moisture to rapidly set. The apparatus is then disconnected, the dam-plates 10 and molding-bar 14 removed, and the method repeated on other ties. After all of the unsupported ties have been thus treated and the cement has set the shims 5 are removed from the alternate ties, and they in turn are treated in the manner above described.

In the use of the invention the regular solid compacted beds of ballast under the ties formed by the weight of the passing trains are not in any way disturbed, but instead of that a solid support conforming to any irregularities in such ballast-bed on the under face of the tie is provided, this bed being of the full width of the tie and giving a broad solid support thereto. The main difficulties due to tamping ballast under the ties are overcome, and at the same time the tracks can be kept in continuous use, the cement mass forced under the ties being of such consistency that it cannot be displaced by the weight of the passing train, but such mass nevertheless containing sufficient moisture to set and form solid beds. The cement intermingles with sand or gravel ballast and forms a mass having irregular surfaces, so that it is free from the objection of ordinary sand or gravel ballast, in that the passing trains suck in under the smooth ties and force out sand, thereby rendering travel disagreeable and gradually carrying off and loosening the ballast and making resurfacing necessary.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The method of surfacing railroad-tracks, consisting in injecting cement under the ties to form supporting-beds therefor, said cement being moistened sufficiently to cause the same to set but not sufficiently to render the same fluid or mobile.

2. The method of surfacing railroad-tracks, consisting in injecting cement under the ties to form supporting-beds therefor, and simultaneously therewith supplying sufficient moisture thereto to cause the same to set but not to become fluid or mobile.

3. The method of surfacing railroad-tracks, consisting in injecting cement under the ties to form supporting-beds therefor, and simultaneously therewith moistening the same with a spray of atomized water.

4. The method of surfacing railroad-tracks, consisting in raising the tie and then injecting cement under the same to form supporting-beds therefor, said cement being slightly moistened to cause the same to set but not sufficiently to cause the same to become fluid or mobile.

5. The method of surfacing railroad-tracks, consisting in tamping the ballast under the ends of the ties, and injecting cement under the ties underneath the rails to form supporting-beds therefor, said cement being moistened sufficiently to cause it to set but not sufficiently to cause it to flow or become plastic.

6. The method of surfacing railroad-tracks, consisting in placing dam-plates at the sides of the ties underneath the rails and injecting cement under the ties to form supporting-beds therefor, said cement being moistened sufficiently to cause it to set but not sufficiently to cause it to flow or become plastic.

7. The method of surfacing railroad-tracks, consisting in injecting under the ties by means of fluid-pressure cement to form supporting-beds therefor, and simultaneously therewith admitting a small stream of water to the fluid-pressure pipe whereby the water is atomized and mingled with the cement.

8. The method of surfacing railroad-tracks, which consists in injecting under the ties by means of fluid-pressure cement in a practically dry state, and simultaneously therewith drawing by means of said fluid-pressure a small stream of water into the fluid-pressure pipe whereby the water is atomized and mixed with the cement.

In testimony whereof I, the said WILLIAM GOLDIE, have hereunto set my hand.

WILLIAM GOLDIE.

Witnesses:
F. W. WINTER,
ROBERT C. TOTTEN.